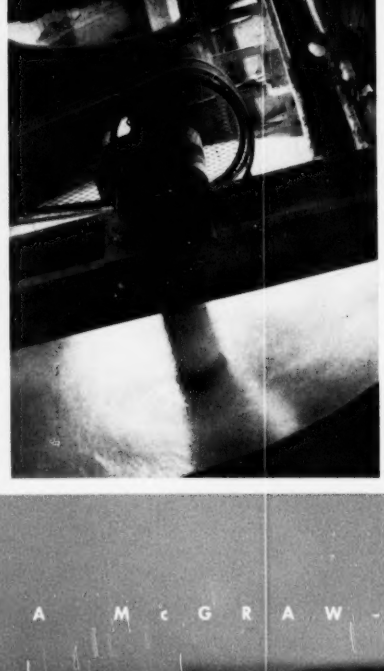
Chemical Industries Week

April 21, 1951

Price 35 cents



Soviet chemical industry; it has weaknesses, but its resources point to rapid progress ..... p. 13

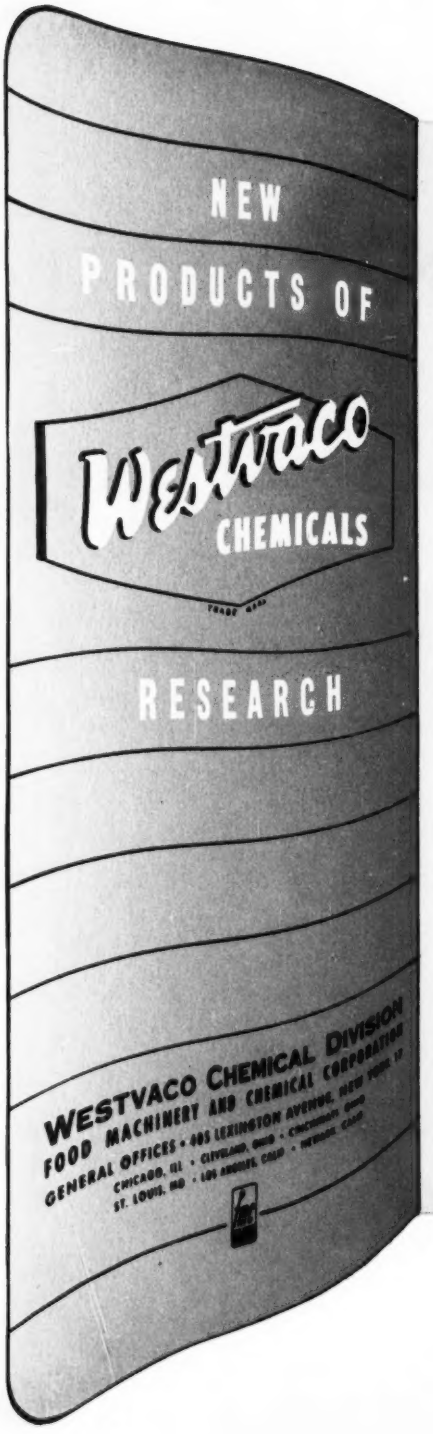
Chemstrand enters nylon manufacture; fiber nears 12-fold war's-end output ..... p. 18

CIW Camera visits first plant to make microspheroidal fluid cracking catalyst ..... p. 26

Aerosol foam cleaner for rugs and upholstery; introduction timed for spring cleaning ... p. 29

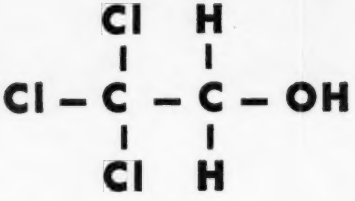
Liquid detergents upsurge bolsters demand for ethanolamines; output upped .... p. 35

A McGRAW-HILL PUBLICATION



Trichloroethanol

Technical



Unusual properties and characteristics of this new alcohol suggest its use for the manufacture of a number of compounds, particularly in the following fields:

Agriculture: Plant growth regulators, insecticides, and fungicides

Petroleum: Oil additives

Pharmaceutical: Intermediate

Rubber and Synthetic Resin: Plasticizers, stabilizers, anti-oxidants, catalyst

Textile: Flameproofing agents

Properties: Westvaco TRICHLOROETHANOL is a viscous liquid with an ether-like odor. It is slightly soluble in water and miscible with alcohol, ether and carbon tetrachloride.

Boiling Point at 760 mm	150°C.
Freezing Point (approx.)	13°C.
Specific Gravity at 25/4°C.	1.541

Availability: Samples are immediately available for evaluation. Larger quantities can be made available.

Technical Data Sheet No. 5-23 gives detailed properties and suggested uses of TRICHLOROETHANOL. Write today for your copy. Requests on your company letterhead for samples will receive our prompt attention. Please address inquiries to: Market Development Division, WESTVACO CHEMICAL DIVISION, FOOD MACHINERY AND CHEMICAL CORPORATION, 405 Lexington Avenue, New York 17, New York.

Chemical Industries Week

April 21, 1951

Volume 68 Number 14

OPINION	2
NEWSLETTER	9
BUSINESS & INDUSTRY	13
RESEARCH	21
PRODUCTION	25
SPECIALTIES	29
MARKETS	33
BOOKS	37
BOOKLETS	40

PUBLISHER ..... Wallace F. Traendly
EDITORIAL DIRECTOR .... S. D. Kirkpatrick
EDITOR ..... W. Alec Jordan
EXECUTIVE EDITOR .. Richard L. Demmerle
MANAGING EDITOR . Howard C. E. Johnson
ASSOCIATE EDITORS: John J. Craig, Herman W. Zabel. ASSISTANT EDITORS: Joseph Gordon, Ralph R. Schulz. REGIONAL EDITORS: Frank C. Byrnes, Chicago; J. V. Hightower, San Francisco; James A. Lee, Houston. ART EDITOR: Woodfin G. Mizell, Jr. EDITORIAL ASSISTANTS: Claire Baker, Donald P. Burke, Leona Mahler, DOMESTIC AND FOREIGN NEWS SERVICE: McGraw-Hill News Bureaus in principal cities of the U.S. and throughout the world.

Consulting Editors:

Lawrence W. Bass	Ernest W. Reid
Benjamin T. Brooks	Norman A. Shepard
John V. N. Dorr	Roland P. Soule
Charles R. Downs	Robert L. Taylor

Chemical Industries Week (including Chemical Specialties) is published weekly by McGraw-Hill Publishing Company, Inc., James H. McGraw (1860-1948), Founder. Publication Office: 1309 Noble St., Philadelphia 23, Pa.

Executive, Editorial and Advertising Offices: McGraw-Hill Building, 330 W. 42nd St., New York 18, N.Y. Curtis W. McGraw, President; Willard Chevalier, Executive Vice-President; Joseph A. Gerardi, Vice-President and Treasurer; John J. Cooke, Secretary; Paul Montgomery, Senior Vice-President, Publications Division; Ralph B. Smith, Editorial Director; Nelson Bond, Vice-President and Director of Advertising; J. E. Blackburn, Jr., Vice-President and Director of Circulation.

Subscriptions to Chemical Industries Week are solicited in the chemical and process industries only from management men responsible for corporate affairs, purchasing, sales, marketing, packaging, research or chemical functions. Position and company connection must be indicated on subscription order. Address all subscription communications to J. E. Blackburn, Jr., Director of Circulation. Allow ten days for change of address.

Single copies 35¢. Subscription rates — United States and Possessions $5.00 a year; $8.00 for two years; $10.00 for three years. Canada $6.00 a year; $10.00 for two years; $12.00 for three years. Pan American countries $7.00 a year; $11.00 for two years; $14.00 for three years. All other countries $20.00 a year; $30.00 for two years; $40.00 for three years. Entered as second class matter July 15, 1944, at the Post Office at Philadelphia 23, Pa., under the Act of March 3, 1879. Printed in U.S.A.

Copyright 1951 by McGraw-Hill Publishing Co., Inc. — All Rights Reserved.

BARECO'S
UNIFORMITY
Saves Dollars...
in { YOUR PRODUCTS and PROCESSES

In order to profitably answer the many problems arising from plant facilities, product use, and customer specifications you must have the RIGHT microcrystalline wax—the wax that meets all your qualifications—EACH time you order, EVERY time you order.

BARECO knows this.

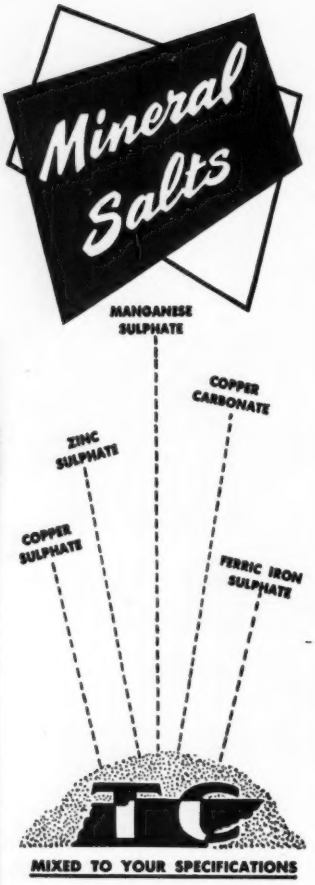
The UNIFORMITY of Bareco's *one and only product*—Microcrystalline Wax—is the direct result of intensive rigid controls from the initial raw material selection through the complex refining procedures. This outstanding stability in Bareco's many grades of waxes has established them as standards for comparison in many industries. Bareco maintains a staff of trained personnel to analyze new wax problems and to help solve questions in the wax application fields.

Samples of Bareco Microcrystalline Waxes and more detailed information will gladly be sent upon request.

Very low water transmission rates
Free from objectionable odors
Chemically inert
Excellent heat sealing characteristics
Supplied in a wide range of melting points, color and hardness

WRITE FOR "THE WAX STORY"
AN INTERESTING NEW PAMPHLET SERIES COURTESY OF—

BARECO OIL CO.
BOX 2009 TULSA, OKLA.
121 S. BROAD ST. PHILADELPHIA, PA.



We are in a position to supply large or small orders of most any Mineral Salts mixtures.

One of the foremost producers of agricultural chemicals and soluble Mineral Salts.

★ COPPER SULPHATE
★ ZINC SULPHATE
★ MANGANESE SULPHATE
★ COPPER CARBONATE
★ FERRIC IRON SULPHATE

SULPHUR-DIOXIDE

For further information write the Tennessee Corporation, Grant Bldg., Atlanta, Georgia or Lockland, Ohio.

TENNESSEE TC CORPORATION

OPINION . . . . .

Available Piperazine

To The Editor: In the article on antihistamines by Dr. Bernard Idson (Mar. 31), the statement appeared that piperazine is not available commercially in bulk.

. . . we have been manufacturing and selling piperazine for the last 10 years in quantities up to 5,000 and 10,000-pound lots, which is certainly a bulk commercial availability.

Inasmuch as we . . . have built up a reputation in the trade, we would appreciate it if you would correct this error in the reasonably near future in one of your issues.

G. Schorsch
President
The Polychemical Company
New York, N. Y.

Sans Taxes?

To The Editor: I am interested in your Opinion Column (Mar. 31) . . . particularly the reply of Mr. Neil Bass on TVA costs of fertilizer.

Evidently the truth hurts . . . If Mr. Bass figures on the self-supporting ability of his operation he will be able to quote the federal, state and county taxes, corporation income tax, etc. . . . that enter into the costs of his product. These would be interesting to know.

If TVA fertilizer is sold under cost of production, without taxes included as charged industry, then whether Mr. Bass admits it or not the taxpayer is "coughing up to cover the deficits".

Public servants should be advised who put up the capital for their plant construction and permitted operation with tax conditions not granted their competition.

J. J. Laudig,
Laudig & Co.,
Scranton, Pa.

For Mr. Bass', and CIW's original comments, see below—Ed.

To The Editors: I appreciate your carrying the item on page 8 of the February 24 issue of Chemical Industries Week to the effect that TVA is holding the line on the price of its ammonium nitrate fertilizer. The latter part of the item—that TVA can hold the line because its costs are not determined by factors that govern private operations—is not entirely accurate.

TVA fertilizer production is on a self-supporting basis. While it is true that there are certain items incurred by TVA in its fertilizer production, the fact remains that the operations are financially self-supporting. Operating costs, including depreciation and an appropriate share of overhead, are more than covered by income from sales of fertilizer. This phase of TVA activity is not supported by Treasury appropriations and taxpayers do not have "to cough up to cover deficits."

Neil Bass
Chief Conservation Engineer
Tennessee Valley Authority
Knoxville, Tenn.

CIW is obliged to Reader Bass for his clarification of TVA's position. Nonetheless he concedes CIW's point that TVA and private industry don't compete on an item-for-item cost basis.—Ed.

Dating 2,4,5-T's Debut

To The Editor: To keep the record straight, I would like to call attention to your mention (Beating the Brush with 2,4,5-T, Apr. 7) of 2,4,5 trichlorophenoxyacetic acid as a "new" weedkiller in 1948.

I am enclosing a reprint of an article of mine that appeared in Better Homes and Gardens of February, 1945 describing my results with this weedkiller. The reason for the somewhat ambiguous description of the actual chemical used was that at the time there was some question . . . as to whether 2,4-D or 2,4,5-T would get the nod as a commercial product.

My experience with the material goes back to the fall of 1943; Vaughn's Seed Store, Chicago offered 2,4,5-T in the fall of 1944. . . . Several early investigators criticized my reports of effective kill of poison ivy since they were unable to kill this species with 2,4-D. The answer was, of course, that 2,4,5-T was more effective on woody plant material . . . did kill poison ivy.

It would probably be more accurate to say that 2,4,5-T was rediscovered in 1948, at which time it was revived because of its effect on woody plants.

R. Milton Carleton,
Research Director,
Vaughn Seed Co.,
Chicago, Ill.

CIW is happy to hear of Reader Carleton's early work, glad to receive the reprint of his popularized account of the research on various herbicides carried on by the U. S. D. A., American Chemical Paint Co., Cornell University, etc. However, this is what CIW actually said: "In 1948, when esters of the then-new herbicide were

. . . . . .

available only in small quantities, practically all went . . . to clearing right of ways for transmission lines, railroads, etc."

"We think that referring to 2,4,5-T in its first year of use on a fairly substantial scale as "then-new" is perfectly legitimate, assumed that all chemical men would realize that much experimental and small-scale work always precedes commercial exploitation.—ED.

But a Small Beginning

TO THE EDITOR: As you properly indicated in your news article "Beating Brush with 2,4,5-T," (Apr. 7) 2,4,5-T is a highly effective new chemical for controlling certain species of woody plants. It does appear to be very promising as an economical means of controlling mesquite under certain conditions on Southwest rangeland. . . .

I should like to point out, however, that the rangeland brush problem is still not completely solved. For one thing, 2,4,5-T will not control mesquite under all conditions. Where it is effective, periodic respraying will probably be needed. We still need to search for better and more permanent types of control.

Furthermore, there are many other kinds of brush that complicate the problem. When mesquite is controlled, other brush has a tendency to take over. Effective killing chemicals have not yet been found . . . for live-oak, shinnery oak, cedar, white-brush, black-brush, and many other kinds of noxious woody plants that have invaded rangeland. . . .

There is still much to be learned about grass re-establishment and methods for keeping brush from reinvading cleared land. In total, research has made but a small beginning in solving this complex brush problem. The discovery that small quantities of 2,4,5-T can control mesquite under certain conditions demonstrates the need for intensive research on the whole rangeland problem.

R. M. SALTER
Chief of Bureau
Agricultural Research Administration
U. S. Dept. of Agriculture
Washington, D. C.

CIW welcomes expressions of opinion from readers. The only requirements: that they be pertinent, as brief as possible.

Address all correspondence to: The Editor, Chemical Industries Week, 330 W. 42nd St., New York City.

BICARBONATE of SODA
MONOHYDRATE of SODA
SAL SODA

STANDARD QUALITY

CHURCH & DWIGHT CO., INC.
Established 1846
70 PINE STREET NEW YORK 5, N.Y.

KESSCO PRODUCTS
CHEMICAL SPECIALTIES

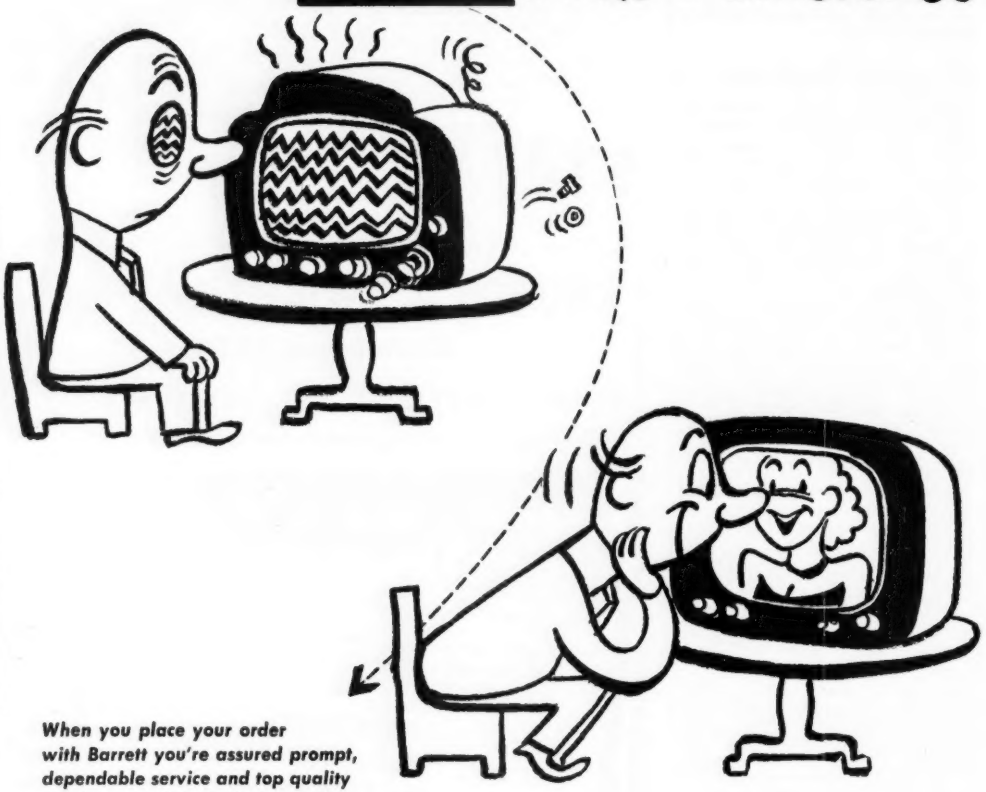
If you are seeking permanent flexibility, heat stability, water resistance, good hand, drape and resilience in your resins,

INVESTIGATE
BUTYL CELLOSOLVE* STEARATE
LAURATE OLEATE
Primary Plasticizers
for
Nitrocellulose, Ethyl Cellulose
Polystyrene, Synthetic Rubbers
Secondary Plasticizers
for
Polyvinyl Chlorides and Copolymers

*Trademark of C. & C. C. Div.

KESSLER CHEMICAL CO., INC.
ESTABLISHED 1921
STATE ROAD and COTTMAN AVE. PHILADELPHIA 35, PA.

WHERE you get it... DOES make a difference



When you place your order with Barrett you're assured prompt, dependable service and top quality products, backed by 96 years of successful manufacturing experience.

WHEN YOU NEED A COAL-TAR CHEMICAL – GET IT FROM...

- Phenols
- Cresols
- Cresylic Acids
- Chlorinated Tar Acids
- Xylenols
- Pickling Inhibitors
- Benzol
- Toluol
- Xylol
- Naphthalene
- Hi-Flash Solvent
- Phthalic Anhydride
- Dibutyl Phthalate
- ELASTEX* DCHP Plasticizer
- "ELASTEX" 10-P Plasticizer
- "ELASTEX" 50-B* Placticizer
- "ELASTEX" 28-P Plasticizer
- Niacin (Nicotinic Acid)
- Pyridines
- Picolines
- Quinoline
- Tar Acid Oils
- Neutral Coal-tar Oils
- Coal-tar Creosote
- CUMAR* Paracoumarone-Indene Resin
- Carbonex* Rubber Compounding Hydrocarbon
- Bardol* Rubber Compounding Oil
- Flotation Agents

Barrett

THE BARRETT DIVISION
ALLIED CHEMICAL & DYE CORPORATION
40 Rector Street, New York 6, N. Y.

*Reg. U. S. Pat. Off.

We Must Pay As We Go

***We** must do our utmost to pay as we go for our present defense program.*

On that proposition those who speak with authority are remarkably well agreed. This editorial – the second in a series on our mobilization for freedom – sets forth in simple terms why there is this agreement.

Next year – the fiscal year beginning next July 1 – the federal government's budget calls for the expenditure of $10 billion more than is scheduled to be collected in taxes. The deficit is due to the increase in defense expenditures.

A part of this deficit can be eliminated by cutting non-essential expenditures and increasing efficiency in the defense program. There is wide agreement on this. It is the duty of the President and Congress to see that it is saved.

How the remaining deficit anticipated in the federal budget—$5 billion to $10 billion—is handled is crucial. The government can meet it by raising taxes—by paying as we go. Or it can borrow, issuing more government bonds.

Borrow Again?

We relied heavily on borrowing in both World War I and World War II. In World War I only about one-third of the expenditures of the federal government were met by taxation. In World War II about 45 percent were met in this way. The rest we borrowed. Some people ask, why can't we rely heavily on borrowing again? Why is it crucially important to avoid adding $5 billion to $10 billion to a federal debt that is already $257 billion?

Part of the answer is found in the contrast between this defense program and our all-out effort of World War II. Another part—and one that is all-important in combatting inflation—results from the rapid decline in the purchasing power of the American dollar in recent years.

We went "all out" in World War II. We put almost half of everything we produced into our military effort. Taxes high enough to pay the financial costs as incurred would have meant huge tax increases. It was feared that such increases would kill financial incentives to get "all out" production. Since we expected the war to be short, borrowing seemed a safe expedient. Price control and rationing, with wartime patriotism to give them effective support, were relied upon to keep in check the inflationary pressure created by borrowing rather than taxing.

Our present defense program is scheduled to take a much smaller share of our production, but to take it over a much longer period. At its peak, the program as now planned will take only about 20 percent of our total national production. But, to use General Bradley's phrase, "the conditions under which we labor may persist for ten, fifteen or twenty years."

What About Controls?

For a period of any such duration it would be foolhardy to expect that the sort of controls we had for the few years of World War II could hold in check the inflationary pressure created by not paying as we go. It would be as foolhardy as it would be for a family to plan on borrowing to pay the expenses of a member discovered to be afflicted by a chronic ailment which might last a long lifetime.

Obviously, the only safe thing to do in such a case would be to adjust the family budget so that the expenses of the illness would be paid currently.

Our heavy reliance on borrowing in World War II had consequences which block a successful repeat performance.

If the borrowing had been done by persuading individuals to transfer their savings into government bonds, relatively little inflationary pressure would have been created. What the government would have spent with the proceeds of such bond sales would have been subtracted from the money individual consumers could spend.

But much of the borrowing was done from banks. That course expanded the amount of money available to the government without any offsetting subtraction of money from the hands of individuals. Thus, when direct price controls were removed after the war, this bottled-up purchasing power contributed to a price inflation which has cut purchasing power of the American dollar about in half – and decidedly changed the attitudes of the American people toward that dollar.

During World War II, Americans in general believed that:

The war would not last long.

The dollar would hold its value, and even gain value after the war.

Many wonderful new products would be available in the postwar period.

Today the American people have:

Seen the value of their dollars melt away fast.

Been assured that, at best, we may have a 10-15-20-year pull ahead.

Been warned not to expect a postwar paradise anytime soon.

One result of these changed attitudes is a notable lack of enthusiasm for government bonds on the part of individual investors. This is indicated by the fact that since Korea redemptions of E bonds have exceeded sales by about $600 million. Another result is a continuing rush to convert dollars into physical goods and equipment or claims on them. This trend weighs against financing the prospective federal deficit by borrowing from individuals.

Borrowing from banks to meet the deficit would again add fuel to inflation.

The prospective deficit is due to federal expenditures for military goods. Even if they are not blown up or shipped abroad, these goods will not be available to civilians. But the money paid to those who produce military goods will still be available to bid up the prices of civilian goods. Thus, at a time when people show relatively little disposition to save dollars, a menacing inflationary pressure – an inflationary gap, the economists call it – will be created.

If our fight against inflation is to be successful this gap must be closed by taxes. We need to do other things, too, for inflation has many different causes. Credit expansion must be effectively controlled. Production of civilian goods must be increased as much as possible by eliminating waste and inefficiency. But a pay-as-we-go tax program is basic to a successful attack on inflation. And inflation – unless it is checked – could wreck our defense effort.

We cannot pay as we go merely by soaking harder the corporations and those in the upper income brackets.

As the President's Council of Economic Advisers has reported, "by far the largest part of the additional revenue must come from the middle and lower tax brackets. These are the brackets in which the great bulk of the income is located."

Taxes Can Attack Inflation

By spreading tax increases broadly, taking small amounts from many people, inflationary pressure would be effectively reduced. It is the expenditures of the great mass of people, rather than the small numbers in the upper income tax brackets, that create most of the pressure. Moreover, it is possible to increase taxes broadly without killing the economic incentives to produce. Maintaining these incentives is essential to the success of the defense effort.

Our elected representatives cannot be expected to be enthusiastic about a pay-as-we-go tax program. It involves increasing the taxes of the great body of their constituents, an operation completely lacking in political glamour. However, such a program also involves the integrity of the American dollar. And that is absolutely essential to the success of the defense program. We shall be very foolish if we do not let our leaders know that we want them to do everything possible to pay as we go.

McGraw-Hill Publishing Company, Inc.

ARMOUR Chemical Division

Fatty Acids
Long-Chain Fatty Acid Derivatives
Industrial Oils

Durable Water Repellents from Fatty Amides

"Armid" is the Armour trade-name given to the general class of long chain fatty amides derived from fatty acids. These high molecular weight amides are high-melting, wax-like materials. The commercially pure amides are water-insoluble and neutral.

One amide in this series, Armid HT, has superior properties for water repellency applications when compared with paraffin and natural waxes.

The excellent water repellent properties of Armid HT derivatives are due primarily to the combination of the amide grouping with a long, saturated straight chain. Durability of the water repellent effect results from the relative insolubility of the derivatives under dry-cleaning operating conditions, and from their high-melting points and poor emulsification characteristics with the soaps and detergents used in laundering.

Armid HT is composed of 25% hexadecane amide, 70% octadecane amide and 5% octadecene amide, is off-white in color and has a melting point of approximately 98° C.

In contrast with the chemical inertness of the hydrocarbons, Armid HT is reactive chemically. Advantage has been taken of its reactivity with formaldehyde in particular to prepare thermally unstable quaternary ammonium salts. These are applied to fabrics from aqueous solution and decomposed under heat to leave an insoluble, durable water repellent residue within the fabric. Reactivity with formaldehyde also permits compounding of stearamide or its derivatives with thermosetting resins to produce durable water repellent effects. Many of these thermally unstable compounds, however, are covered by patents and those patents should be consulted.

Armid HT is packaged in flake form in 100 lb. multi-wall paper bags. For samples or additional information on the Armids, mail the coupon below.

Low-Temperature Solvent Crystallized Oleic Acid

Another new product has been added to Armour's line of fatty acids. Already the manufacturer of the most complete line of high-purity distilled fatty acids that can be found anywhere, the Armour Chemical Division now offers low-temperature solvent crystallized oleic acid.

This exclusive process offers users of oleic acid a product that has advantages not found in ordinary distilled or pressed products. The extremely low temperatures employed guarantee a substantially lower saturated acid content than conventional types of oleic acid. In addition, solvent crystallized oleic acids are ester-free materials since the solvent used is not reactive with fatty acids. This new product is characterized by bland odor and has excellent heat stability.

Armour's low-titer White Oleic Acid meets U. S. Pharmacopeia specifications and is recommended for those uses that require a light color as well as a low titer. For applications that require a low titer but not a very light color, low-titer Distilled Red Oil is recommended.

White Oleic Acid
(Low Titer)

	Min.	Max.
Titer	—	5°C
Iodine No. (Wijs)	90	95
Acid Value	195	201
Saponification Value	195	201
Unsaponifiable	—	2%
Color (Lovibond 5¼" tubes)	—	1.5R-15Y

Distilled Red Oil
(Low Titer)

	Min.	Max.
Titer	—	5°C
Iodine No. (Wijs)	90	95
Acid Value	193	200
Saponification Value	193	200
Unsaponifiable	—	3%
Color (Lovibond 1¼" tubes)	—	8.0R-30Y

Armour's Oleic Acids are available in 55 gallon drums and aluminum tank cars. Write today for samples and prices.

Lard Oil Lubricants

Lard oil possesses the property of "oiliness" so essential in the lubrication field. In addition, lard oils are readily saponified when treated with alkalies and possess non-drying qualities.

Where a high grade lubricant is required, as in drawing copper and brass tubing, Extra Winter Strained Lard Oil is recommended. Its low free fatty acid content makes it ideally suited as a base for such products.

Extra Winter Strained Lard Oil is only one in a complete range of lard oils offered to the lubrication field by the Armour Chemical Division. Write today for your free copy of a chart showing "Specifications for Armour Industrial Oils."

Reading for Research Chemists

To help research chemists, the Armour Chemical Division continually prepares informative literature on chemicals derived from fats. The two technical bulletins described below are available free of charge.

For research chemists interested in fatty amines (organic bases or alkalies made from fatty acids), Armour has prepared a detailed 24-page bulletin entitled, "The Chemistry of Fatty Amines."

"The Chemistry of Fatty Acids" is the title of another technical bulletin offered by the Armour Chemical Division. It describes fatty acids, their composition, reactions, and derivatives.

Either or both of these booklets are yours for the asking. Use the coupon below to make your request.

Mail this Coupon

Please send additional information on

•.....

•.....

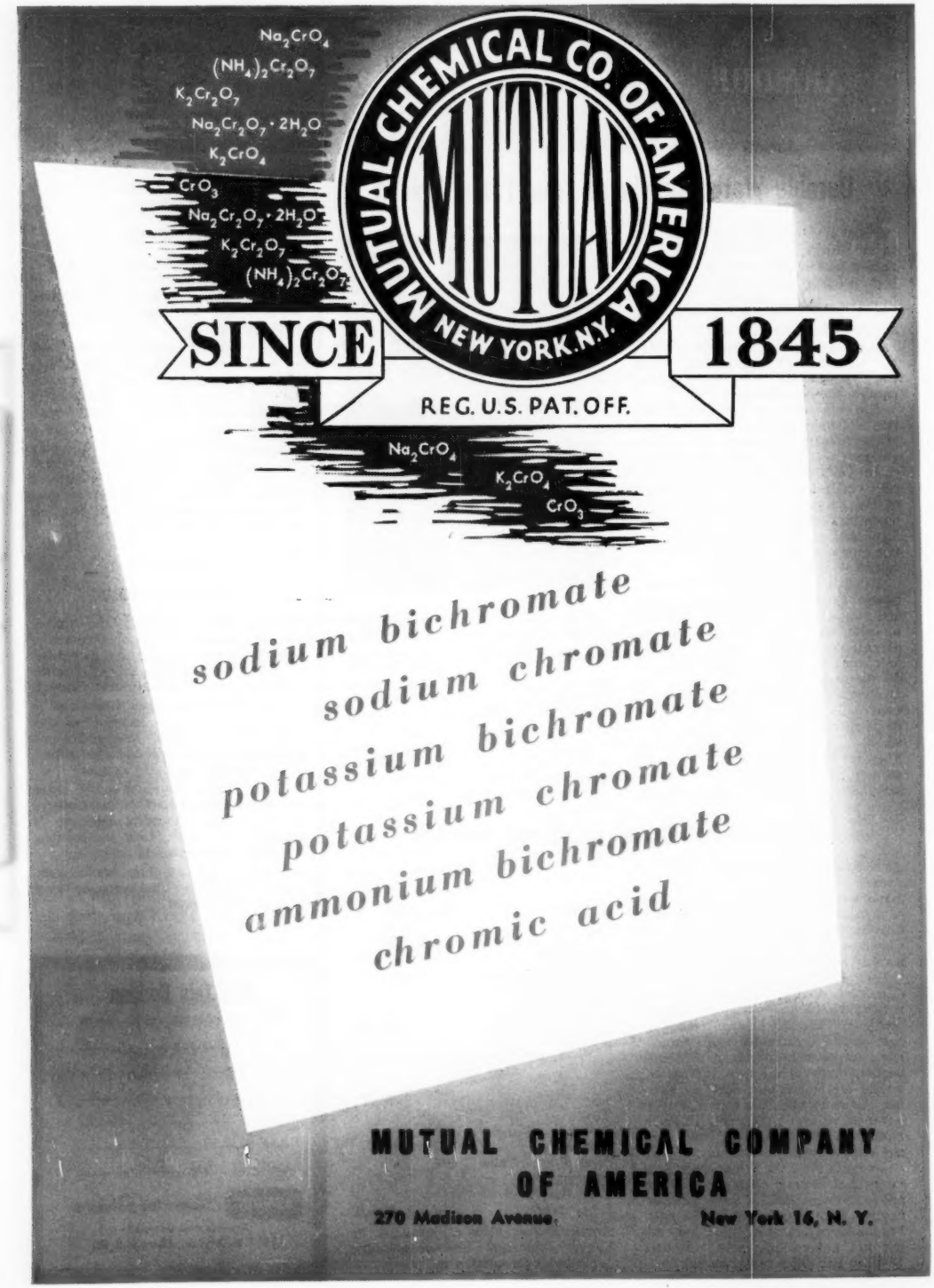
Name.....*Title*.....

Firm.....

Address.....

City.....*Zone*....*State*.....

ARMOUR Chemical Division
Armour and Company
1357 W. 31st St., Chicago 9, Ill.


Na_2CrO_4
$(NH_4)_2Cr_2O_7$
$K_2Cr_2O_7$
$Na_2Cr_2O_7 \cdot 2H_2O$
K_2CrO_4
CrO_3
$Na_2Cr_2O_7 \cdot 2H_2O$
$K_2Cr_2O_7$
$(NH_4)_2Cr_2O_7$
MUTUAL CHEMICAL CO. OF AMERICA
MUTUAL
NEW YORK, N.Y.
SINCE
1845
REG. U.S. PAT. OFF.
Na_2CrO_4
K_2CrO_4
CrO_3
sodium bichromate
sodium chromate
potassium bichromate
potassium chromate
ammonium bichromate
chromic acid
MUTUAL CHEMICAL COMPANY
OF AMERICA
270 Madison Avenue
New York 16, N. Y.

Chemical Industries Week

BUSINESS MAGAZINE OF THE CHEMICAL PROCESS INDUSTRIES

NEWSLETTER

The chemical industry this week is assessing the effect on plant expansion, equipment and container procurement of the Controlled Materials Plan which NPA will put into operation July 1.

Only three materials—steel, copper and aluminum—are affected, but these metals are keystones in the basic chemical structure, ramify into every phase of chemical operation.

Chances are that the industry will make out all right. The metals will be allocated directly to producers on the basis of detailed requirements, submitted in advance, for manufacture of goods needed by the Government for its defense program. Certain defense-supporting activities, vital to meeting rearmament needs, will also be included—and chemical plants will undoubtedly fall in that category.

Officials of plants affected by CMP will have plenty of time to bone up on its details. Forms, operating instructions, and the list of controlled products will be made available by May 1—two months before the bell is rung to get the program under way.

NPA will make it as easy as possible for businessmen to learn the rules: meetings will be set up in key cities, a question-and-answer booklet and a series of pamphlets and manuals will be published.

Smaller chemical firms may get more Government business. In Washington this week Senator Sparkman (Dem., Ala.) is working to establish a Smaller War Plants Corporation—similar to the set-up during World War II. He also wants a law to give small firms preferential treatment, which is now illegal; he would actually make it mandatory to give some types of contracts to the smaller companies.

Plain fact is that small firms are not getting the Government's business; and you can expect some action from joint hearings, scheduled soon, of the House and Senate "small-business" committees. Under fire will be the military services and the NPA. The latter's rubber conservation order (M-2) is a particular target for attack.

Certificates of necessity also made news in Washington as the Defense Production Administration decided to release the percentage of new plant investment certified. Earlier only the company name, plant location, product and amount certified were given out.

Also, DPA is releasing figures on all certificates to show amount applied for and amount eligible. They're usually the same—but exceptions prove that DPA is looking hard at all applications.

News from Texas will cheer sulfur producers, and a development in Mexico will please sulfur users. In Texas, a State House committee killed a proposal to raise the state tax on sulfur from $1.27 per long ton to $5. Sulfur companies contended that the tax increase might well curtail expansion of sulfur mining in the state.

In Northeastern Mexico, the Mexican oil monopoly, Pemex, is now operating a new plant to recover sulfur from natural gas. General Chemical Division (Allied) aided in building the unit.

As CIW predicted last week (p. 12), NPA has tightened its MRO order (Regulation 4), cutting out many so-called "maintenance and repair" items for which priority could be used.

Trouble was, MRO orders were fighting with defense orders (DO's) for the same items; result was a confusing welter of competing priorities.

Now no longer subject to call under Regulation 4 are all chemicals; nylon fiber and yarn; packaging materials and containers; paint, lacquer and varnish; rubber tires and tubes; photographic film; and railroad track equipment.

More brass for chemical plant equipment and fewer brass fixtures and fittings for plumbers is the upshot of a proposed NPA order suggested by the plumbing brass goods industry advisory committee.

The committee wants to prohibit manufacture of less essential items, give carte blanche to chemical plants, laboratories and hospitals for use of brass where substitution isn't practical.

An existing order controls amount of copper manufacturers can use; the proposed order would spell out the actual items that could be made.

Zinc, the other component of brass, is in such short supply that the industry doesn't want to see current restrictions on its use eased.

Incidentally, a chemical man has moved into a top NPA post: Thomas S. Nichols, who took leave as president of Mathieson Chemical Corp. to be special assistant to NPA Administrator Manly Fleischmann, is now Deputy Administrator of NPA, succeeding Glen Ireland.

Here are some down-to-earth figures on the worsening manpower situation: In normal times 2,500 to 3,000 graduating chemical engineers find jobs in industry. Last June 4,300 graduates found employment, and there is no surplus available today. But only about 3,200 are graduating this June; only 2,200 (assuming the normal "mortality") will finish in 1953; and the current freshman class will supply only 1,800 to 2,000 in 1954. These figures take no account of possible losses to the draft.

The American Institute of Chemical Engineers, which compiled these statistics, foresees a crippling shortage of engineering manpower.

Chemical firms operating Government-owned plants on contract will take on a new responsibility May 1. A new section (No. 13) has been added to the Armed Services Procurement Regulations putting the onus of "maintenance, repair, protection and preservation" of the Government property on the contractor.

The Government is still the self-insurer of its plants, but it's now up to the contractor to look after them.

More Canadian aluminum seemed a certainty this week as clearing of the site at Kitimat, B. C., got under way. Piling is going down for a $200,000 loading wharf.

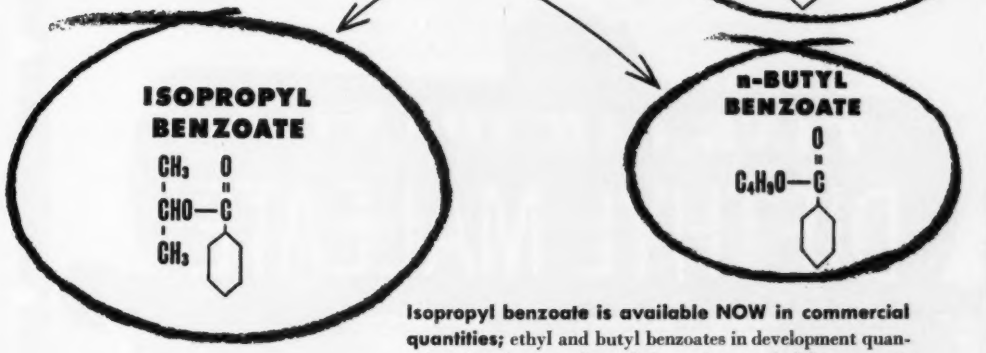
Aluminum Co. of Canada has not given the final go-ahead to the $500 million hydro and smelter project, but approval seems to be in the cards in view of the extensive preliminary work now being undertaken.

. . . The Editors

are you looking for

- high boiling solvents for resins, dyes, and inks?
- ready sources of benzoic acid via ester exchange?
- ingredients for perfumes?

then check these ALKYL BENZOATES



Isopropyl benzoate is available NOW in commercial quantities; ethyl and butyl benzoates in development quantities. Another member of the series, methyl benzoate, is available in research quantities.

For trial samples or for technical assistance, call or write the nearest Carbide and Carbon Chemicals office *today*. Ask for our technical bulletin "Alkyl Benzoates," (F-7589). It provides you with additional data and is a permanent reference for your work.

CARBIDE AND CARBON CHEMICALS COMPANY

A Division of
Union Carbide and Carbon Corporation
30 East 42nd Street UCC New York 17, N. Y.

Offices in Principal Cities
In Canada:
Carbide and Carbon Chemicals, Limited, Toronto

physical properties

	Methyl Benzoate	Ethyl Benzoate	Isopropyl Benzoate	n-Butyl Benzoate
Molecular Weight	136.1	150.2	164.2	178.2
Specific Gravity	1.088	1.048	1.011	1.007
Boiling Point, °C.	198.9	212.8	219	249.4
Vapor Pressure at 20° C., mm. Hg	0.37	0.18	0.12	0.13

This extremely reactive ester opens new fields of investigation in the manufacture of pharmaceuticals, rubber chemicals, resins, plasticizers, and surface active agents. It incorporates ester groups which offer real advantages over maleic anhydride in many cases. A liquid at ordinary temperatures, it can be easily handled in a closed system. Diethyl Maleate is miscible with most organic solvents.

Call on our Technical Service Division for help in applying this useful compound to your products or processes. Dimethyl Maleate and Dibutyl Maleate are available in experimental quantities. For free samples and further information about these three maleates, write, wire or phone today!

PROPERTIES:	DIETHYL MALEATE
Formula:	$(:CHCO_2C_2H_5)_2$
Molecular weight (calc):	172.18
Density, g/ml, at 25°C:	1.0637
Weight per U. S. gal. at 25°C:	8.88
Coefficient of Expansion,	
20°C to 30°C, per 1°C:	0.00094
per 1°F:	0.00052
Refractive Index, n_D at 25°C:	1.4533
Boiling Point, °C at	
760 mm of mercury:	225.3
200 mm of mercury:	177.7
10 mm of mercury:	99.4
Heat of Vaporization, kcal/mole:	12.5
Melting Point, °C:	-11.5 (approx.)
Viscosity, centipoises, at 25°C:	3.14
Flash Point, Cleveland Open Cup:	250°F
Surface Tension, dynes/cm, at 25°C:	36.7
Solubility,	
M1 H_2O in 100 ml product:	2.1
M1 product in 100 ml H_2O:	1.3

CSC

COMMERCIAL SOLVENTS CORPORATION • 17 E. 42nd STREET, NEW YORK 17, N. Y.

PRODUCTS OF THE INDUSTRIAL CHEMICAL DIVISION: Ethyl Alcohol and Derivatives • Acetone • Butanol and Derivatives
Crystalline Riboflavin • Methanol • Amines • Nitroparaffins

Chemical Industries Week—

BUSINESS & INDUSTRY . . . . .

Soviet Chemical Industry Has Far to Go

Russia has adequate supplies of most chemical raw materials, but sparse domestic reserves of key minerals—non-ferrous metals, sulfur, fluorspar, barite and uranium—is a serious roadblock to the Soviet chemical industry's rapid progress.

While the Russians are quite far advanced in particular fields, over-all technology is mediocre, will require many man-years of brains and brawn to bring it up to Western standards.

But they have a remarkable capacity—demonstrated by their fabrication of an atomic bomb—to attack and accomplish what has to be done; and it would thus be sheer folly to fall back on easy generalizations and pooh-pooh their industrial potential.

How strong is Russia? is a question voiced alike by military leaders, State Department officials, and plain citizens. But the answer—when one is given—is more often than not based largely on speculation; for little solid information trickles through the cracks and fissures of the Iron Curtain.

This week Russian-born, American-educated Demitri B. Shimkin, staff member of the Russian Research Center at Harvard University, told CIW some of his conclusions based on his patient, painstaking piecing together of facts relating to Russia's economy.

Shimkin's conclusions are of paramount interest even if they are considered only as a comparative assessment of one of the two giants—U. S. and Russia—in the earth today. But since a modern army moves more on its steel and chemicals than on its stomach, any evaluation of the Soviet industrial fabric takes on an added, somber significance.

Trump Cards: Nature has dealt well with Russia in many strategic raw materials. She has plenty of petroleum for fuel and—eventually, perhaps—petrochemicals. Phosphates (for fertilizer and phosphorus chemicals) are abundant. Large deposits of salt provide for an active chlorine-caustic industry. Also in good supply are such basic materials as natural sodium sulfate, potash salts (from which are also obtained magnesium and bromine,) chrome, vanadium, borax, platinum and asbestos. Rising coal and steel production provides ample coal tar for chemical utilization.

These are Russia's trump cards—but she also has losers, some of which could conceivably spell the difference between a winning and a losing hand.

Losers: Chief among this group is sulfur. There are some large deposits of sulfur minable by the Frasch process, but, unlike the exceedingly pure American product, it is mixed with a high proportion of tar and bitumen. Even worse, the sulfur isn't where the need is—at the pulp and paper installations in Siberia, at the oil refineries in the Caucasus.

As a result, elemental sulfur is used only where the product from pyrite (which is none too plentiful) can't be used. The Russians have had some success in winning sulfur from smelter gases, and since 1940 a fruitful source has been "coal brasses"—sulfur concretions occurring to the extent of about 3% in lignite.

Sulfur difficulties have led—as in other parts of the world, indeed—to sulfuric acid shortages. Local dearths have hampered pulp and oil refining operations. The Russians have had to use sodium sulfate, large deposits of which occur near the Caspian Sea, where acid would normally be used; e.g., in the manufacture of ammonium sulfate. Russian sulfuric acid production is about 2 million tons a year, compared with our 10 million tons.

Russia's fluorspar is either low quality or inaccessible—i.e., on the Northeastern Arctic coast. There are few domestic deposits of barite, needed for drilling muds in the oil industry; and local supplies of such non-ferrous metals as tin, zinc, lead and uranium are slim. Nickel, copper and platinum, however, are relatively plentiful.

Advocates of a unified Germany must face up to the fact that the Russian Zone supplies the Soviet economy with vital materials—materials over which Russia presumably would not surrender control without a struggle. They include, uranium, fluorspar, barite, lead and potash. As vital to the Russians as raw materials are German plants and engineering technology.

Spotty Technology: Russia's chemical engineering is paradoxical in that primitive practices exist side by side

with superlative technology. In comparison with metallurgy and machining (where productivity is of the same order as Great Britain's), the chemical industry, by and large, is backward.

As recently as 1946, for example, hand methods were used in drawing and sorting natural sodium sulfate; no large-scale, continuous methods were in use. Losses in refining of lead, zinc and other non-ferrous metals run 15%-20%, whereas recovery in this country is 95% or better; poor flotation chemicals and not enough attention to process integration are held responsible. While Russia has plenty of chrome and vanadium, manufacture of ferrochrome and ferrovanadium has apparently proved an obstacle; consequently, shortage of corrosion-resistant alloys has retarded development of such processes as Fischer-Tropsch. It may also have slowed rebuilding of the war-destroyed nitrate industry, but no reliable information is available on that point.

Russia has been particularly active in the petroleum field, but even here technology is average or below, depending on the phase under consideration. Much work has been done on cracking catalysts for the Winkler-Koch and Houdry processes, but they haven't come up with anything better than those in use here. Only since the war have the Russians developed fortified greases, and sulfur content in gasoline and jet fuels is still an unconquered handicap.

The thread running through Russia's technological deficiencies can be expressed in two words: low purity. It shows up in nickel, for example, where the Russian equivalent of A.S.T.M. standards calls for 99.9% material—but the best anyone has seen is 97+%. Lack of reagent purity puts a burden on the laboratories, which must spend a great deal of time and effort on purification.

Instrumentation is still generally on the manual level. As a result, quality control is poor and as many as a fifth of the plant operators are engaged in checking 100% of a run. Since process analysis is rudimentary, all this checking is futile in so far as it doesn't result in improved processing.

Some Bright Spots: But the picture isn't all black by any means. The Russians are outstanding in geochemistry—rare earth, heavy metals, etc. Their development of beryllium preceded ours and Germany's. They have done a good job on graphite, insecticidal soaps (OSRD found them superior to the Germans'), poison gases, and refining of rare metals.

Brightest star in their crown is fabrication of an atomic bomb. They processed German ore containing only 0.07% uranium, removing 96.5% gangue and refining the remaining 3.5%, which contains only 2% uranium.

What it boils down to is this: The Russians can attack one problem at a time and carry it through to a successful conclusion. But they have so far to go and so many things to do, they must take first things first. If Western technology were static, there's no doubt that Russia would catch up in time; but we ourselves are moving fast enough so that Russia, as Shimkin says, "will have to run like hell to stand still."

Many American scientists take comfort in Russia's policing of information, expecting that this suppressive policy will cause Russian science to wither on the vine from lack of scientific interchange. But Shimkin points out that Russia's primary jobs are digestion and utilization of the data already available, and training of young scientists and technologists to make up war losses. (Russia has far fewer scientists than we, and most of them are very young or very old.) In these jobs Marxist dialectic is not likely to interfere, and until they're done, Soviet science will not suffer.

Russia has the resources, the manpower, the average proportion of good brains and, above all, the appreciation of chemical technology's material benefits to press forward. Although they're currently far behind the Western nations, they shouldn't be sold short for the long pull ahead.

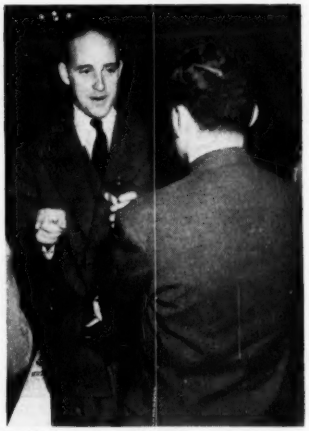
Dextran Migration

An English firm, Dextran Ltd., is investing $6 million in a U.S. plant to make blood plasma extender. Production at the rate of 20,000 pints per month will equal existing output at each of 2 foreign plants.

Site of the new plant is Orange N.J. and if everything proceeds according to schedule, the wheels will be turning in 6 months. Recent negotiations between Dextran general manager Thomas C. Usher and Philip Tell of the Tell Manufacturing Co. (Orange, N.J.), clinched the deal resulting in the formation of Tell and Usher Ltd.* to manufacture the English material.

Their product, known as Intradex, is a dextran solution of the variety recently launched by Commercial Solvents, Inc. (CIW, Feb. 17, '51).

* Tentative name although as yet unchanged.



THOMAS C. USHER: Dextran in Johannesburg and Orange, N.J.

Outstanding feature, according to Usher, is molecular homogeneity.

Ticklish operation: Major problem in making dextran polysaccharide suitable for plasma extender is controlling size of polymer molecules. If the extender solution contains too great a proportion of sub-standard molecules, it will literally leak through the capillary walls and be rapidly excreted by the kidneys. An average molecular weight of about 70,000 is the goal, but achieving it involves the ticklish operation of breaking down larger polysaccharide molecules. Usher claims that hydrolysis by ultrasonic waves does the job.

Moreover, Intradex is apparently non-pyrogenic, easily sterilized, and stable in storage at ordinary temperatures. The product is now before the U. S. Food and Drug Administration. FDA approval is a requisite for civilian marketing although the armed forces can stockpile plasma extenders on their own authority and responsibility. Armed forces, however, are guided by the opinion of the National Research Council.

Prospects: Intradex patents are held by the East Anglia Chemical Co., Ltd., prominent in the manufacture of plastics, paints, and lacquers. East Anglia is the parent of Dextran companies in England (Darlington) and South Africa (Johannesburg)—each capable of turning out 20,000 pints per month. Stockpile orders received from several foreign sources have sparked negotiations for future plants in Norway, Denmark, Australia, and Germany. Latest reports have another U. S. plant in the offing; San Fran-

cisco is the locale under consideration, but nothing is definite yet.

If and when Intradex gets a good American foothold, Tell and Usher plan to go ahead with other commercial, dextran-based products. Most are brand new and still in the pilot-plant stage in England.

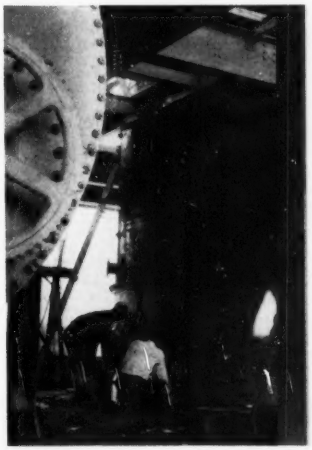
Sans Presses

Presses are being squeezed out of the soybean processing field. Solvent extraction is now the method-of-choice for recovery of soybean oil. Completion of extraction plants (2,-200 tons soybean oil per day) now under construction will permit 75% of the soybean oil to be produced by solvent extraction processes rather than by screw or hydraulic pressing.

At present it is estimated that about 65% of the soybean oil is recovered by solvent extraction processes. The exact figure is difficult to determine as some of the new plants are replacements for existing expellers. And some of these expellers are placed in standby condition for use when market conditions warrant.

Start: Solvent extraction of vegetable oils in the United States had its start in 1933-4 with the installation of two Hansa-Muhle (Bollman) and three Hildebrandt continuous extractors. The Hildebrandt extractor at the Archer-Daniels-Midland plant in Chicago was the first successful large-scale continuous oil seed extraction plant in the United States.

From these beginnings oil seed extraction has grown to its present high level. Large-scale continuous extraction systems are now being offered by Allis-Chalmers Manufacturing Co., French Oil Mill Machinery Co., V. D. Anderson Co., Vulcan Copper & Supply Co., and the Chemical Plants Div., Blaw-Knox Construction Co. Smaller plants are available from Detrex Corp. and Crown Iron Works.



SOLVENT EXTRACTOR: Replacing another press.

Why? The major advantage of solvent extraction is the higher oil recovery. The oil content of expeller meal is about 5% while that from solvent extraction processes is usually less than 1%. Also the value of the protein recovered from solvent extracted meal is much higher than that from pressed meal. The pressed meal is usually overheated during the pressing operation with subsequent deterioration. Power and maintenance costs are lower for extraction plants than for expellers.

As yet, it is difficult to solvent extract products with a relatively high oil content such as tung nuts and peanuts. These materials tend to disintegrate and the fine particles formed clog up the extractor. Further, the initial cost of a solvent extraction plant is higher than that of the expeller plants.

Trichlorethylene: Trichlorethylene will be used in three large-scale solvent extraction plants which are to begin operation this summer: Shellabarger Mills, Inc., Decatur, Ill., Funk Bros. Seed Co., Bloomington, Ill., and A. E. Staley Manufacturing Co., Painesville, Ohio.

A major advantage of trichlorethylene over the usual hydrocarbon solvents (hexane and heptane) is its resistance to flammability. Also it produces a purer soybean oil. Phospholipids (lecithin and cephalin) are more completely removed and it is easier to obtain complete solvent recovery from the residual meal. Disadvantage: Trichlorethylene is much more expensive than hexane or heptane.

Linseed Oil: Commercial extraction of linseed oil from flaxseed did not begin until about four years ago. Today, at least four companies are extracting the oil. Flaxseed has a high oil content and earlier attempts resulted in production of excessive fines. This problem has been solved by fore-pressing the seed before solvent extraction.

A similar system has been technically successful for the extraction of cottonseed oil. However, the economic advantages of solvent extraction over pressing are not as clearly defined as for soybean and linseed oil. Thus to a great extent the system to be installed for recovery of cottonseed oil will probably depend a great deal on local conditions such as the size of the market for high-grade meal.

Long Run: Solvent extraction has captured the soybean oil recovery market. And, as more knowledge is gained about handling high oil content seeds, it can be expected to move further into recovery of peanut, cottonseed and linseed oils.

Isotope Quiz

Massachusetts survey of radioisotope users points up the need for closer regulation, serves as basis for needed remedial measures.

A joint project of Mass. Departments of Public Health and Labor and Industries, the survey was conducted by means of a questionnaire sent to academic institutions, industrial laboratories, hospitals and other isotope users. Information requested, covered the following phases of the broad situation: personnel, laboratory design, equipment, waste disposal, instrumentation, and hazard monitoring.

Results emphasize the need for some form of control. Returns showed no generally accepted policy on medical checkups and treatment for overexposure. Laboratory design takes every shape and form; equipment is in the same state. Although most installations had beta-gamma survey meter-monitoring devices, personnel protection techniques were inadequate in all but large organizations that maintained health-physics and monitoring groups.

Closer supervision is needed in disposing of wastes as some existing practices are dangerous and should not be allowed to set precedents that will be difficult to eliminate. Finally it was found that instances of carelessness due to indifference or lack of training occur mostly in small installations lacking safety experts.

Recommendations include pre-employment personnel indoctrination courses; physical examinations prior to employment and blood counts at 3 month intervals thereafter; definite policy regarding prevention of overexposure and ingestion of harmful materials; health-physics or monitoring groups to serve all needy installations.

Perhaps most important, was the request for a central state agency—with powers of enforcement—to regulate laboratory design, equipment, and waste disposal.

INFORMATION EXCHANGE: American scientists question German experts.

Know-how Export

Western Europe is about to receive a hefty flow of technological information from this country. **Experts base** this prediction on the recent grant of $40,000 by the Economic Cooperation Administration to the Commerce Department's Office of Technical Services. **The money will be used to run a program to furnish American technical** information to European industry.

The idea is to encourage the spread of better processing techniques by making use of the wealth of technical information that appears in American business and industrial periodicals.

OTS has already started a technical digest service to scan the trade press of this country and prepare synopses of significant articles. These digests are sent to production centers in 18 European countries. At these centers, the digests will be translated into the local language and distributed.

Reverse English: The program is almost an exact reversal of the original mission of the OTS . . . that of making available to American businessmen the scientific and industrial advances of the Germans and the Japanese. Most of this information originally came from captured documents. But later, American industrial teams visited captured enemy plants to learn first hand about new processes that could benefit this country's industries. Over 200,000 reports resulted from these visits.

Spokesmen for the OTS claim that a close watch will be maintained under the new "export" system to make sure that the digests will actually be transferred and distributed as intended.

57 Varieties: The first set of digests, arranged in a loose-leaf notebook style, carries information in 57 categories. It was sent out last month. OTS hopes that U.S. technical information will excite both labor and management groups in Western Europe to constructive steps.

The digests are being sent with a covering statement warning against the use of copyrighted material without express permission of the publisher. The digests themselves will in all cases avoid the use of any quotation of more than a sentence in length, OTS officials say.

Law of the Forest

New legislation provides for sale, assignment, or licensing of process patents developed in the Oregon Forest Products Laboratory.

Under the terms of the law, State Board of Forestry is authorized "to sell, transfer, license or assign, in whole, or in part to any person, firm or corporation, any patent rights acquired by the State of Oregon from any employee of the Forest Products Laboratory or from any other source and relating to forest products utilization".

Forty percent of net income from such transactions will go to the state's general fund; remainder is earmarked for the laboratory to supplement funds made available to the institution in 1947.

Forest Products Laboratory, a cooperative venture of the state board and Oregon State College, has been in operation about three years. Considerable work has been done on the saccharification of wood wastes, and a patent has been obtained on a method of extracting wax from lignin residues remaining after saccharification. A patent—now pending—for extraction of wax from fir bark, will in all probability be granted in the near future. The laboratory is currently trying to simplify its wax-from-bark process, to make it economically attractive to small companies.

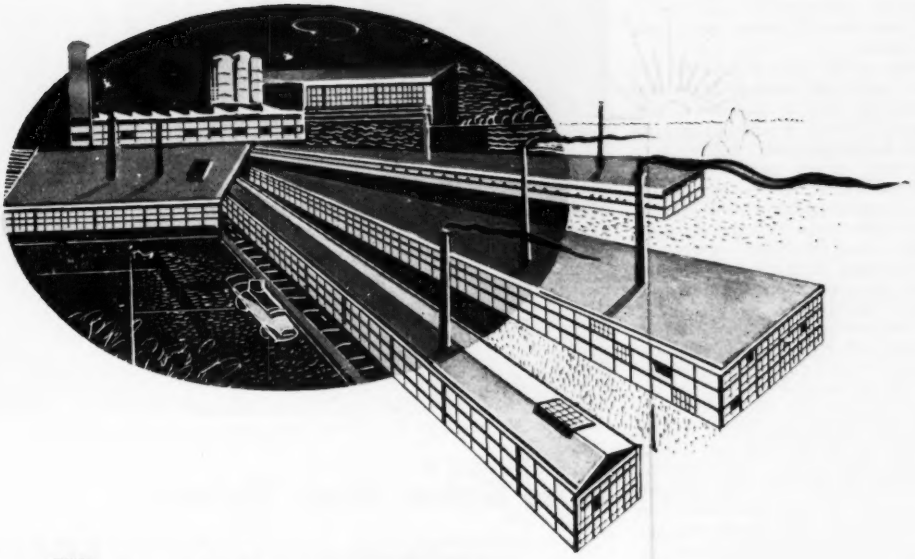
Other patent applications have been filed: a fluidized bed process to produce activated char, charcoal, and synthesis gas from wood wastes; a method of manufacturing specialty products from wood shavings; a controlled compression process for plywood; and several as-yet-undisclosed projects.

Helping Hand

New, remote-control mechanical arm, developed by General Mills, Inc., duplicates many functions of its human counterpart. Intended primarily for use with radioactive substances, the device could easily be applied to other handling problems.

To demonstrate the machine's versatility, Charles H. Bergsland—project engineer of the development—recently put it through its paces at General Mills' Minneapolis aeronautical research laboratories. Operated solely by remote control, the arm displayed its brawn by carrying half a ton across the room. Equally gentle, it lifted an egg without cracking the shell. For an encore, the robot—a screwdriver in its claw—took apart

BERGSLAND AT THE CONTROLS: For protection, an arm of steel.



We're doing our best

to deliver the goods!

Stauffer plants from coast-to-coast are working . . .

Night and day to deliver the greatest quantities of high quality industrial chemicals to our customers.

We know that we cannot always fulfill your requirements of a particular product, due to shortages of raw materials or taxed facilities. But we want you to know that we are doing our level best to keep our plants running at full capacity so that you, too, can do your part in producing at peak loads.

Stauffer Products

- BHC (Benzene Hexachloride)
- Borax
- Boric Acid
- Boron Trichloride
- Carbon Bisulphide
- Carbon Tetrachloride
- Caustic Soda
- Chlordane
- Chlorine
- Citric Acid
- DDT (Dichloro Diphenyl Trichloroethane)
- Ethylene Trithiocarbonate
- Silicon Tetrachloride
- Sodium Hydrosulphide
- Sulphur-Specially Processed For All Industrial and Agricultural uses.
- Sulphur-Insoluble (For Rubber Compounding and Other Uses).
- Sulphur Chloride
- Sulphuric Acid
- Tartaric Acid
- Textile Stripper
- Titanium Tetrachloride
- Toxaphene (Chlorinated Camphene)

Stauffer CHEMICALS SINCE 1885

STAUFFER CHEMICAL COMPANY
420 LEXINGTON AVENUE, NEW YORK 17, N.Y.

221 North LaSalle Street, Chicago 1, Ill. • 824 Wilshire Boulevard, Los Angeles 14, Cal.
636 California Street, San Francisco 8, Cal. • 424 Ohio Bldg., Akron 8, Ohio
Apopka, Florida — North Portland, Oregon — Houston 2, Texas — Weslaco, Texas

and reassembled an electric motor.

Although the General Mills machine is the newest, it is not alone in the field. Others have been developed, but they all have some basic limitation.

One of the most popular to date is a small hand-powered device that accurately follows motions of the operator, but it is suitable only for light laboratory work. Another is an electrical gadget with a confusing array of control buttons and switches. An electrical-powered servo system, now in the works, will give the operator a sense of "touch" comparable to the small hand-powered job. But high cost and complicated design are major drawbacks.

Designers of the General Mills device did not try to make a mechanical replica of the human arm. They tried instead, to produce the simplest machine possible for the required operations. Principle of "touch" was discarded on the grounds that the operator must learn to interpret this sensation before he could properly manipulate the controls. Rather, they felt it would be faster for the operator to learn correct control-motions.

While a machine couldn't possibly equal the human arm for many jobs, it would have decided advantages over the flesh-and-blood article. It would be stronger, more durable, could move through wider angles, and make simple motions with greater accuracy.

One Handle Does It: The arm's basic movements are controlled with a single handle. Resembling an upside-down pistol grip, the handle functions in much the same manner as an airplane's joy-stick. Pushing it forward causes the upper arm to swing forward; pulling it back, reverses this motion. Moving it to the side results in rotation of the upper arm. A twist to the left or right revolves the hand; grip is opened and closed by means of buttons. When the handle is released, it springs to a neutral position, stopping all activity.

General Mills developed the mechanical arm (under contract with the Kellex Corp. of New York) as a protective measure for personnel working with dangerous radioactive materials.

Lion's share of credit belongs to project engineer Bergsland, chief aeronautical researcher P. R. James, and electronics expert Henry J. Stringer. General Mills engineers believe that some day the arm, mounted on a radio-controlled and television-equipped power truck, will make possible the control of delicate operations at many miles distance.

YARN READY FOR SHIPPING: New capital, new plants point to . . .

More Nylon, More Makers

Chemstrand Corp. arranges financing for a 50 million lbs.-per-year nylon plant—Du Pont's first domestic competition. In canada, CIL plans manufacture of nylon raw materials.

Du Pont, too, is still building plants. Total domestic capacity within two years will be 240 million lbs.—a twelvefold rise in seven years to a half billion-dollar annual business.

A loan of $110 million was arranged last week between Chemstrand Corp. (Monsanto Chemical Co. and American Viscose Co.) and institutional investors with the aid of Morgan, Stanley & Co. and Dillon, Read & Co.

This is one of an orderly series of events which will lead to the construction of a plant for Chemstrand to produce 50 million pounds of nylon per year. It will be the first such unit to be erected in the United States in competition with E. I. du Pont de Nemours & Co.–but Du Pont is still constructing nylon plants. In Canada, too, Canadian Industries Ltd. is planning to manufacture (in Alberta) nylon raw materials for its present spinning operations.

CIW estimates that Du Pont's new unit, combined with the Chemstrand plant, will be able, by late 1952 or early 1953, to provide 240 million pounds of nylon per year–a twelvefold growth in plant capacity in seven years.

Chemstrand: The process to be used by Chemstrand is unknown; but the benzene shortage–it is now being made from petroleum cyclohexane–and need for butadiene to produce synthetic rubber probably rules out these possibilities. The choice thus is limited to furfural or petroleum cyclohexane or a combination of the two.

With hosiery yarn selling for about $2.75 per pound and staple fiber for $1.60-$1.85 per pound, gross sales will be equivalent to about $500 million–$100 million for Chemstrand and $400 million for Du Pont. This $400 million will provide 25-30% of Du Pont's gross sales, and probably an even greater percentage of the profits –a disproportionate share for any one product. This fact, and the Justice Department's predilection to look askance at business bigness, are sufficient reasons for Du Pont to license nylon to Chemstrand before its patent monopoly expires.

Phenol to Butadiene: The two common nylon intermediates, hexamethylene diamine and adipic acid, are presently produced from four different raw materials: benzene from coke ovens, cyclohexane from petroleum, furfural from oat hulls or corn cobs, and butadiene from petroleum.

The first commercial nylon, made at

Belle, W. Va., was from benzene via phenol. The phenol was converted first to cyclohexanol, then in turn to cyclohexanone, adipic acid, adiponitrile, and hexamethylene diamine. The phenol process was dropped a short time later in favor of one based on oxidation of benzene-derived cyclohexane. This process is currently operating at Belle, W. Va., and Orange, Texas. The Orange plant also oxidizes petroleum-derived cyclohexane to adipic acid with nitric acid. It is believed that either air or nitric acid can be used for benzene-based cyclohexane.

Only adipic acid will be produced at Orange when the new Victoria plant gets into full production. The Victoria plant produces adiponitrile from butadiene. A single hydrogenation of the nitrile will convert it to hexamethylene diamine to be combined with adipic acid from Orange to form nylon.

At Victoria butadiene is chlorinated and a mixture of 1,4- and 1,3-dichlorobutenes separated. These react either with sodium cyanide or with hydrogen cyanide, in the presence of caustic soda, to produce 1,4-dicyanobutene. Hydrogenation can produce either adiponitrile (1,4-dicyanobutane) or, carrying it further, hexamethylene diamine.

Oat Hulls & Corn Cobs: Adiponitrile is also being prepared from corn cob- or oat hull-derived furfural at Niagara Falls, N. Y. Furfural is converted to furan and this is hydrogenated to tetrahydrofuran. With hydrogen chloride, 1,4-dichlorobutane is formed for conversion to adiponitrile with sodium cyanide. The Niagara Falls product is shipped to Belle where nylon salt is formed with the adipic acid available at that location.

A second adiponitrile-from-furfural unit is believed to be under way at Memphis, Tenn., where Du Pont is installing a new 60 million pound-a-year sodium cyanide plant in the same area as Quaker Oats' huge furfural plant. With the completion of this plant, Du Pont will probably cease production of hexamethylene diamine from adipic acid—a difficult and costly procedure.

Diversification: Du Pont's diversification of raw material sources, fruit of a time-consuming job of research and development, has paid off handsomely. By the time benzene became short, the company was using or building plants based on furfural, petroleum cyclohexane, and butadiene. Benzene can be produced from petroleum cyclohexane; but with proper plant equipment, adipic acid can be formed directly from the same source.

NYLON PRODUCTION CAPACITY
(millions of pounds)

Process		1945	1950	1951	1952
Chemstrand Corp. site to be selected	?	—	—	—	50
E. I. du Pont de Nemours & Co.					
Belle, W. Va.	Via cyclohexane from benzene	20	35	50	50
Memphis, Tenn.	Via furfural and sodium cyanide	—	—	—	20
Niagara Falls, N.Y.	Via furfural and sodium cyanide	—	20	30	30
Orange, Texas	Via cyclohexane from petroleum and from benzene	—	45	45	45
Victoria, Texas	Via butadiene and hydrogen cyanide	—	—	45	45
Total		20	100	170	240

Thus, for the long term, Du Pont is protected from many drastic curtailment of nylon production by raw material shortages. And the capital requirements for nylon production are so great that any major shutdown could jar even a Du Pont.

KEY CHANGES . .

Stanley J. Freeman, sales manager of Witco's Los Angeles office, is now vice president, will head up company's Pacific Coast Division.

•

Victor E. Wellman will be the new director of the Process Engineering Department for the Calco Chemical Division of American Cyanamid. Since 1949, Wellman has been associate director of process development.

•

General Aniline and Film: Two men have been promoted to the position of associate director of research at GAF's research labs in Easton, Pa.: W. A. Schmidt has been section leader and research coordinator there; G. E. Goheen was assistant director of research.

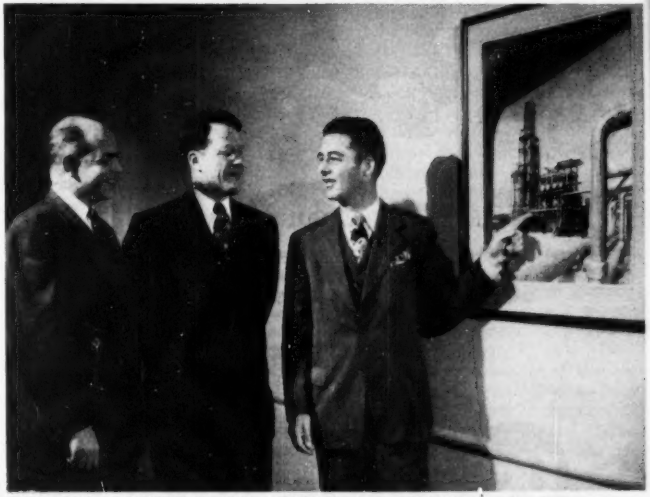
•

Roy J. Miller, works manager for Julius Hyman & Co. will be vice president in charge of manufacturing.

•

David L. Mathews has recently been named plant manager of the Avon Lake (Ohio) plant of B. F. Goodrich.

Jefferson Promotes Three



WILLIAM H. BOWMAN, MAX NEUHAS, L. P. SCOVILLE: The three men are newly elected v. p.'s for Jefferson Chemical. Neuhas and Scoville have been with the company since its inception in 1945. Most recently, Neuhas has served as manager of the Technical and Research Dept., Scoville as manager of production. Bowman joined the company in 1945, has recently been manager of sales.

U·S·S BENZOL
is helping to make tires

■ The rapidly-expanding synthetic rubber program is making heavy demands on benzol-producing facilities. As a result of this and other defense applications, this vital chemical is in extremely short supply and subject to emergency controls.

United States Steel is making every effort to distribute as equitably as possible its entire production of this critical material. United States Steel Company, 525 William Penn Place, Pittsburgh 30, Pa.

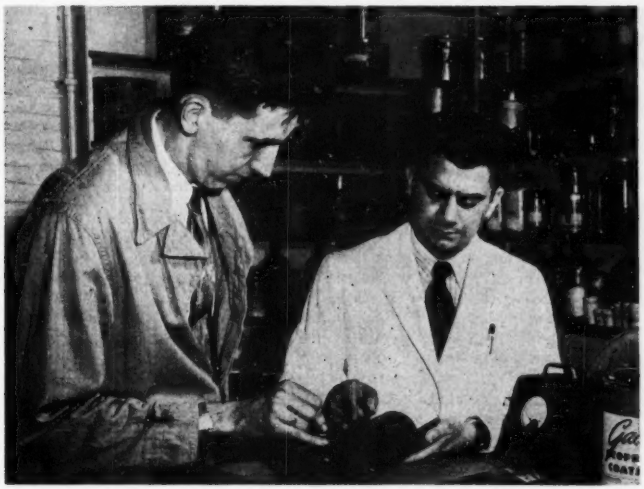
The complete line of U·S·S COAL CHEMICALS

Benzol . . . Toluol . . . Xylol . . . Phenol . . . Cresols
Cresylic Acid . . . Naphthalene . . . Pyridine . . . Picolines
Creosote Oil . . . Ammonium Sulphate.

USS

U·S·S COAL CHEMICALS

UNITED STATES STEEL



BENNUNG AND DEAKINSON: Switching neoprenes eliminated the accelerator.

Air Cure For Neoprene

First unaccelerated, air drying neoprene protective coating, is the result of a year's research at Gates Engineering Co.

Endowed with outstanding chemical resistance, the material is a departure from usual paint-type maintenance coatings.

Successful development of the new coating did not come about as the result of any sudden stroke of genius. Despite its unique and rather startling features, the material is really a logical dividend of continued neoprene technology. Possibility of producing an air-drying neoprene had intrigued Gates chemists and engineers for a long time. They were old hands at neoprene with several first-rate commercial coatings to their credit. But all of these needed accelerators to convert the liquid neoprene to a serviceable rubber layer.

Ordinary neoprene solutions are relatively dilute. Spread on an exposed surface, they form a soft, grimy mass which never completely hardens. Chemicals (e.g. dinitroso benzene, thiurams, etc.) must be added to accelerate conversion of the jelly-like material to dry rubber. These accelerators are added to the liquid neoprene prior to use. After the accelerator has been introduced, the synthetic rubber tends to gel in its container and must be used within a short time.

Gates' goal was ready-to-use neoprene that would not solidify in the can. Obviously, this meant eliminating the accelerator—but how? A study of the nine varieties of neoprene, provided the answer in type KNR.

Here was a neoprene, almost tailor-made for the job. More soluble in common aromatic vehicles than its relatives, KNR permits formulation of solutions with high solid-content. The drastically reduced solvent content rapidly and thoroughly evaporates after application of the solution on open surfaces; neoprene begins to cure as soon as it hits the air. No accelerator is needed and the solution has an indefinite can-life.

The resultant coating is intended for use on equipment and construction materials subject to corrosive atmospheres. In this capacity it competes with more established alkyd and vinyl resin paints, but exceeds them in life-expectancy and corrosion-resistance. Long life of the coating is due to neoprene's excellent chemical stability and natural flexibility. Danger of degeneration from vibration, thermal expansion, etc., is almost completely eliminated.

Testing of the new coating, conducted by an independent organization, generally proved its worth, but also showed the need for certain improvements. Steel rods, given 3 brush coats, were immersed in 2% solutions of sodium hydroxide, hydrochloric, nitric, and sulfuric acids at 50 C. for 60 days. These conditions are far more rigorous than any that would be encountered in actual use. After 2 months of continuous immersion, the rods were inspected.

Chemical resistance was perfect—no evidence of corrosion was discovered. But adhesion was deficient on the clean steel. The project went back to the laboratory where the difficulty was soon ironed out. It was found that the coating gave a good bond on rusty steel—with only a preliminary wire-brushing—but needed a primer when applied to bare metal. A phosphoric acid-vinyl resin wash primer turned the trick, bringing adhesion well into the acceptable limits.

Commercial Debut: The coating went into production late in 1950 as a new addition to the company's line of Gaco Neoprene Coatings.

Since that time, others apparently have learned the trick. Very recently, the Atlas Mineral Products Co. has come out with its own low-temperature curing neoprene which goes by the name, Neobon.

Packaged in 5-gallon cans and 50-gallon drums, Gates' material is easily pigmented with corrosion-resistant carbon black and titanium oxides. As a sideline to the job it does as a coating, the new product also makes a good cement for joining materials like wood and Celotex. Further development along this line is now in progress, but no claims are being made at this time.

Successful achievement of the new neoprene coating was due in large measure to the efforts of chemical engineers Carl Bennung and James Deakinson. Although their baby has left the protective confines of the laboratory, the job is not finished.

They are now accumulating performance data from users, as a basis for evaluating the product in its many possible applications.

CROSBY

THE MARK OF QUALITY

STEAM DISTILLED WOOD TURPENTINE

Attractive Pint, Quart, Gallon and 5 Gallon Containers
Tank Cars

LIMED ROSINS

Calbrite, FF-L-45

ESTER GUMS

Glycerol and Pentaerythritol Types

PALE WOOD ROSINS

All Grades X to K

BEREZ

A dark wood resin available in solid or solution

GLOSS OILS

Gloss Oil 60
Gloss Oil 65

MALEIC MODIFIED ESTERS

Crosby 1015, 1016, 1417, 1418

★All Pale Rosins and Resins Available in New Type Light Tare, Scrap Value, Aluminum Drums.

CROSBY CHEMICALS, INC.
DE RIDDER, LOUISIANA
Plants: Picayune, Miss., and De Ridder, La.
REPRESENTATIVES IN ALL PRINCIPAL CITIES

Auto-Fluoridator

New fluoridating agent for municipal water supplies automatically regulates aqueous fluoride-ion concentration. Substance's low toxicity—about 85% less than sodium fluoride's—reduces health hazard to water plant personnel.

A fluorine-containing alum, the material, tagged Flural, will release fluoride ion in solutions containing less than 0.8 to 1.5 parts per million—the desirable range. When fluoride concentration is too high, Flural removes at least a portion of the excess by flocculation.

One marked advantage of the material over others in the field is its adaptability to existing water-works equipment. Most fluorine compounds are highly poisonous, requiring air-tight packaging and accurately calibrated feed equipment for safe administration to water systems. Flural, however, calls for no such attention; it may be handled by equipment normally used to add more prosaic alums.

Composition of Flural itself may be varied to give a fluorine content of anywhere between 9 and 18%. The fluorine content in any specific case is selected to provide the optimum concentration of fluoride ion at the usual minimum alum feed rate. In most instances, Flural will supply normal alum requirements, but in areas where high flocculant dosages are prescribed, supplemental filter alum may be used.

A product of the Ozark-Mahoning Co., Tulsa, Okla., Flural is still in the experimental stage. Pilot-plant capacity is now 1,000 pounds a week, but Ozark-Mahoning expects to up this figure by July of this year. At that time, new facilities will be ready to supply whatever demand develops.

•

New Paint Vehicle: Australian paint researchers are currently busying themselves with butyl titanate and other lower esters of titanic acid. Certain interesting properties of these compounds apparently suit them for high-temperature paint vehicles.

Films of butyl titanate do not dry in the ordinary sense. They rapidly hydrolyze to a brittle, non-adherent titanium dioxide. But when inorganic pigments are incorporated the titanium dioxide acts as a cement—binding pigment particles into a dry, highly heat-resistant finish.

Exposure tests on smoke stacks and exhaust pipes have demonstrated the protection afforded by a paint system of two coats of butyl titanate-zinc dust paint followed by two coats of butyl titanate-aluminum paint. Additional trials, now underway, will determine resistance to sea water.

•

Intermediates: Monsanto Chemical Co. is now offering 3,3'-diamino-4,4'-dihydroxy diphenylsulfone and 4,4'-dichloro-3,3'-dinitro diphenylsulfone in research quantities. The compounds—proposed as dye intermediates—are useful in the preparation of a number of substituted diphenylsulfones.

•

New Elements: Existence of technetium and promethium, predicted more than 50 years ago, has been conclusively confirmed by spectroscopic analysis at the National Bureau of Standards. The obscure elements are fission products of uranium.

•

Better B_{12} Bug: Streptomyces olivaceus, a microorganism discovered in Japanese soil, promises to be a new commercial source of vitamin B_{12}. The mold flourishes on broths of distillery by-products and soybean meal, and effects definite fermentation time-savings. Vitamin yield is substantial.

•

Plasma Substitute Specs: Armed Services Medical Procurement Agency has finally issued to manufacturers, proposed specifications for 6% gelatin and dextran blood plasma substitutes. Requirements are similar to existing standards for plasma and administration equipment. But, in addition to sterility and freedom from metals and pyrogens, dextran solutions must pass an antigenicity test on rabbits, an anaphylactic test on guinea pigs.

•

Selective Zirconium Reagent: New analytical procedure readily separates zirconium from commonly associated metal cations (i.e. thallium, iron, beryllium, uranium, manganese, nickel, and cerium). A single precipitation with phthalic acid, in weak hydrochloric solution, does a thorough job.

•

Furacin Not Ready: Although Furacin has proved its effectiveness as a cortisone producer in rats, experimental work has not progressed to the point of human administration. The corn-derived drug is too toxic and probably too potent. Studies with laboratory animals conclusively demonstrated pituitary stimulation which, in turn, resulted in increased secretion of cortisone.

Announcing

CRYSTALLINE VITAMIN A ACETATE

available in stabilized, high potency, dry granular form and as a liquid palmitate derivative

For the first time in history, crystalline Vitamin A, has been produced by synthesis *on a commercial scale.*

No longer is it necessary to tolerate the extraneous materials found in previous natural and synthetic products. All the important advantages of the pure crystalline material are now available in unrestricted volume in these new Pfizer products:

STABILIZED CRYSTALLINE VITAMIN A ACETATE

A dry product of exceptional stability which can be handled, measured and stored under all normal conditions. Insensitive to oxidation or humidity, *Stabilized Crystalline Vitamin A Acetate* fills a long felt need for a dry, high-potency product which can be used in the manufacture of Vitamin A tablets, in the fortification of foods and in the preparation of other dry products, without fear of deterioration.

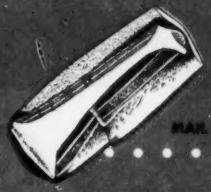
VITAMIN A PALMITATE

Derived from pure Crystalline Vitamin A Acetate, the outstanding purity and high potency of this product make it ideal for use in oil solutions and aqueous dispersions. It is also particularly suited to the fortification of milk and other liquid food products where taste is a factor. Excellent stability.

WRITE OR PHONE FOR COMPLETE DETAILS

These new Crystalline Vitamin A derivatives make possible higher quality products than ever before attainable and open the way for many new applications. Write for samples, prices and technical data.

Pfizer



STABILIZED CRYSTALLINE VITAMIN A ACETATE

Physical Characteristics — Finely divided dry powder, light yellow color, practically odorless and tasteless.

Potency — Standardized at 500,000 U.S.P. units per gram.

Purity — Derived from Crystalline Vitamin A Acetate, the only pure form of this vitamin commercially produced.

Packaging — Packaged in standard amber glass, screw type bottles and in drums.

VITAMIN A PALMITATE

Physical Characteristics — Liquid — yellow color, practically odorless and tasteless.

Potency* — Not less than 1,600,000 U.S.P. units per gram.

Purity — Derived from pure Crystalline Vitamin A Acetate, it has a purity of 90-95%.

Packaging — Packed in aluminum bottles under nitrogen.

*Also available in oil solution at a potency of 1,000,000 U.S.P. units per gram.

MAIL COUPON FOR TECHNICAL DATA

Chas. Pfizer & Co., Inc., 630 Flushing Ave., Brooklyn 6, N. Y.
Kindly send me Technical Data on Crystalline Vitamin A.

Company.....

Address.....

.....

Type of Business.....

Interested in Vitamin A for.....

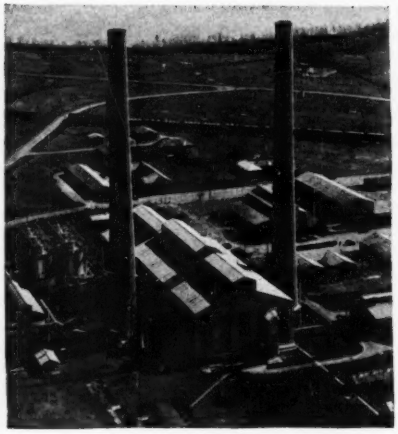
.....

Signed by.....Position.....

SULPHUR

*Interesting Facts Concerning This Basic Raw Material from the Gulf Coast Region

*MINING



The process of mining sulphur, as developed by Herman Frasch, takes advantage of the fairly low melting point of sulphur (about 240° Fahrenheit). The process resolves itself into three parts: one, operating a power plant that heats and pumps to the field large quantities of water; two, distributing the hot water through wells to melt the underground sulphur, and raising the melted sulphur to the surface; three, cooling and solidifying the sulphur in large vats from which it is broken and loaded into cars for shipment.

The power plant and water reservoir, as well as the vats and permanent structures, are placed at some distance from the sulphur deposit to avoid possibility of damage from surface subsidence, resulting from extraction of the underground sulphur.

Loading operations at our Newgulf, Texas mine

TEXAS GULF SULPHUR CO. INC.

75 East 45th St. New York 17, N. Y.

Mines: Newgulf and Moss Bluff, Texas

PRODUCTION . . .

Acid and Cement

There is currently an epidemic of new sulfuric acid processes as engineers strain their ingenuity to increase production of this short but needful commodity. Attention in England is now being focused on a new £3.5 to £4.0 million sulfuric acid-from-anhydrite plant at Merseyside. Being installed in South Wales on a smaller scale, but using similar processing techniques, is British Steel Research Association's new process for acid recovery from tinplate descaling wastes.

This week England began to erect its second sulfuric acid-from-anhydrite plant at Merseyside. It is estimated that it will cost £3.5 to £4.0 million ($9.8 to $11.2 million), produce 150,000 tons of sulfuric acid and a somewhat larger quantity of cement clinker. With governmental priority for delivery of materials and equipment, production should begin within two years.

Capital for construction of this unit is being supplied by a number of sulfuric users, including such companies as Cortaulds, Ltd. (rayon) and Fisons, Ltd. (fertilizer). Technical know-how is being provided by Imperil Chemical Industries. which will act as consultant on the project. ICI will not be a capital participant.

ICI gained it knowledge by operating a similar plant at Billingham—the second one ever built. (The first, a large pilot plant, was built by I. G. Farbenindustrie A-G. at Leverkusen, Germany; the third near Marseilles, France; and the fourth at Wolfen, Germany. All operate on anhydrite except possibly the French plant, which is believed to be operating on gypsum.)

Anhydrite to Acid: Basis of the ICI-engineered plant is smelting anhydrite or gypsum in the presence of coke and clay to produce cement clinker and sulfur dioxide. Cement is produced from the clinker by mixing it with a small percentage of gypsum to control the setting rate and grinding. The sulfur dioxide, after cleaning, is passed through a standard contact acid plant.

Data from the Wolfen plant indicates general outlines of the Merseyside process: Powder for charging the smelting kilns is provided by grinding a mixture of 78% anhydrite, 9.6% dry clay, 4.8% dry sand, 0.8% pyrite cinder and 6.8% coke breeze. Sand is added to provide the proper silica/alumina ratio for cement. Pyrite cinder, from a pyrite sulfuric acid plant, is added to up the iron content of the cement clinker.

Proper operation of the kiln produces a raw gas containing 7.5-8.5% sulfur dioxide, which must be cleaned, cooled and dried. Part of the cooling is by radiation as the gas passes through dust collecting chambers and then through electrostatic precipitators. Final cooling by a water spray is followed by a further cleaning in wet electrostatic precipitators. Drying of the cleaned gases is with 96% sulfuric acid. The dried gas then enters the standard contact sulfuric acid unit.

Tinplate Waste to Acid: Composition of the waste liquor from tinplate descaling, mostly ferrous sulfate, is such that a process akin to the IG-ICI method can be used. The new procedure, to be installed on a large-scale experimental basis at the Steel Co. of Wales's South Wales tinplate mill, consists of mixing the waste liquor with coke, and flash roasting the resultant mixture.

After cleaning and drying, sulfur dioxide from the roaster is passed through a contact sulfuric acid plant. Acid is returned to the tinplating plant for reuse. Iron oxide can be returned, after sintering, to the blast furnace.

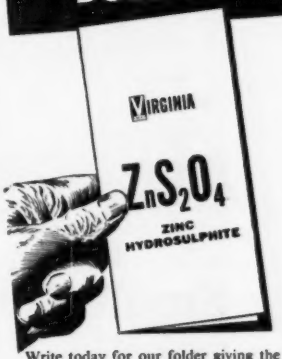
The new process will reduce sulfuric acid production costs only slightly. However, its adoption should cut "new" acid requirements of the tinplate industry by about 75% on a total consumption of 50-70 thousand tons per year.

Not Enough: Each year the United Kingdom used about 1.8 million tons of sulfuric acid. This figure will have to be lowered at least 300,000 tons this year as sulfur imports are restricted. The 150,000 tons from the new plant plus the potential tinplate savings of about 40,000 tons per year don't make up the deficit, so that British will have to take even further steps to prevent a decline of their economy. But further extension of these processes—in England, on the Continent, and conceivably elsewhere—will relieve the pressure on U. S. elemental sulfur resources.

•

Corrosion Comparator: A pocket-sized slide rule-type comparator will quickly rate thirteen non-ferrous and stainless steel alloys for 142 corrosion situations. Four ratings, excellent, good, fair and not good, are given. The comparator is offered by the H. M. Harper Co.

"VIRGINIA" ZINC HYDRO DOES IT!



Write today for our folder giving the applications for the powerful reducing properties of "Virginia" Zinc Hydrosulphite. VIRGINIA SMELTING COMPANY, Dept. CI, West Norfolk, Virginia.

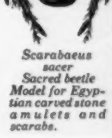
VIRGINIA Chemicals
Established 1898
Field Offices: NEW YORK • BOSTON • CHICAGO
PHILADELPHIA • DETROIT • ATLANTA

Go the scientific way...go MGK

Insecticide Concentrates for

AEROSOLS
DUSTS
SPRAYS

We offer *complete formulas* . . . ready to put right into your aerosol bombs or your retail packages or . . . *combinations* of insecticides and synergists that leave you only the minimum of processing to do or . . . the purest toxicants and synergists *in their primary forms*. MGK has the *best* of whatever you want.

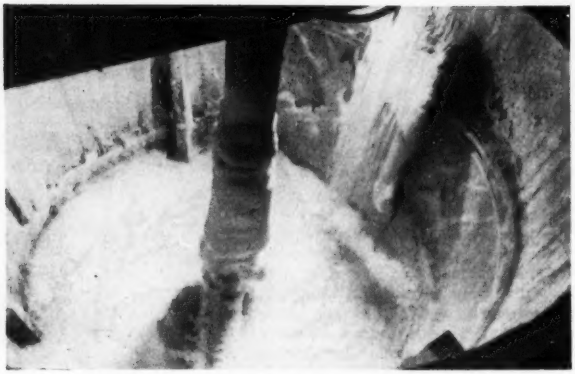


THE PIONEERS OF PYRETHRUM AND ALLETHRIN

For complete information write 1709 SE 5th St., Minneapolis, Minnesota

McLAUGHLIN GORMLEY KING COMPANY

Scarabaeus sacer
Sacred beetle
Model for Egyptian carved stone amulets and scarabs.



1 DAVISON'S new microspheroidal catalyst for fluid "cat" crackers gets its start in this tank where hydrosol from sodium silicate and sulfuric acid is mixed with water.

Small Spheres Make Better Catalyst

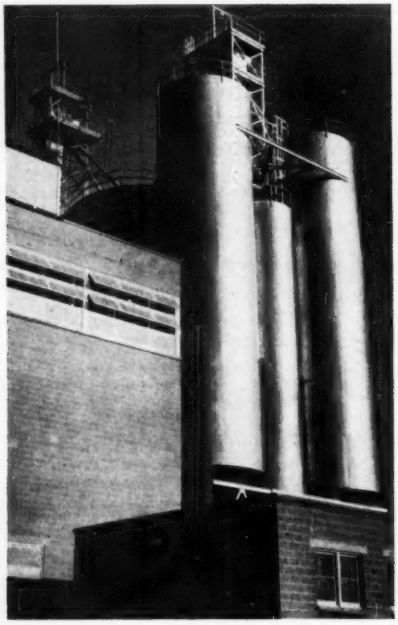
Recently completed is Davison Chemical Co.'s new microspheroidal (small spheres) catalyst plant at Cincinnati, Ohio. The catalyst is used in fluid "cat" crackers by petroleum refiners to make aviation and motor gasolines from higher-boiling fractions.

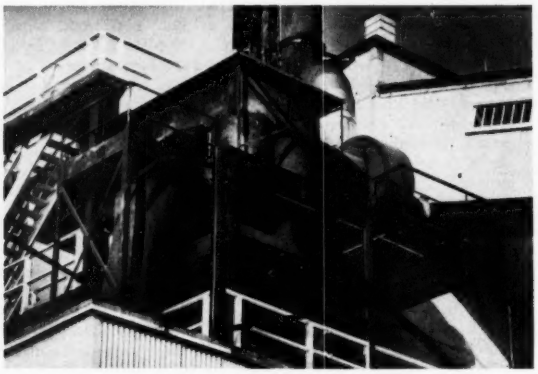
Taking a tip from soapmakers, who have long made tiny spheres of soap by spray drying, Davison is spray drying a slurry of a silica-alumina hydrogel to convert it into the microspheroidal product.

Ground Catalyst: In earlier plants a silica-alumina hydrogel was formed, dried, ground and sized. But in the new unit the hydrogel is separated by a string filter, reslurried and pumped under high pressure into the top of a stainless-steel spray dryer. Here it meets a blast of hot air and is converted into the desired spherical-shaped particles.

Cyclonic dust collection equipment is used to separate the dried catalyst from the hot gas stream before passing to the three vertical storage silos. From these the catalyst is loaded onto closed hopper cars for shipment to the refineries to begin producing gasoline from the heavier hydrocarbons.

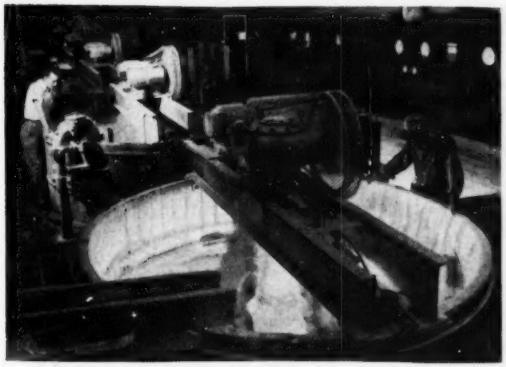
The new microspheroidal product has a more uniform particle dimension and thus loss of relatively expensive catalyst is reduced. Also, Davison reports that the rounded surfaces of the spherical masses make them more resistant to inter-particle attrition.



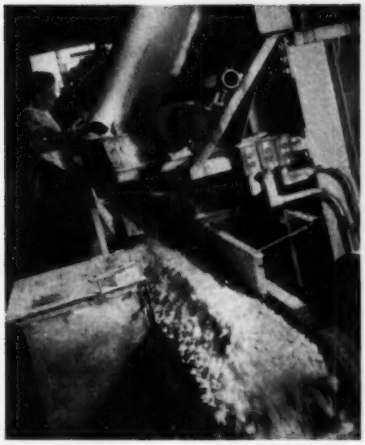


6 FROM THE SPRAY DRYER the hot gases pass through a dust collection system to recover all fine catalyst.

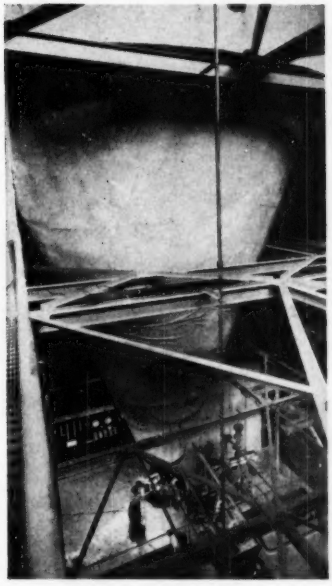
7 AFTER DRYING, the catalyst is moved to three storage silos. From these it is loaded into hopper cars for shipment.



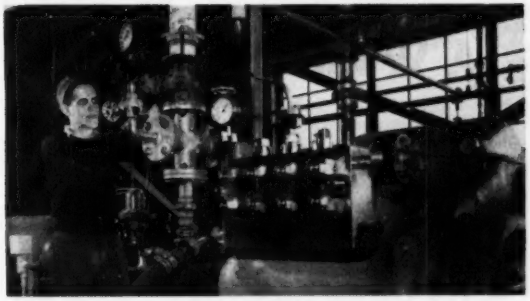
2 THE MIXING TANK is the first of a series of five in which the hydrosol is impregnated with alumina.



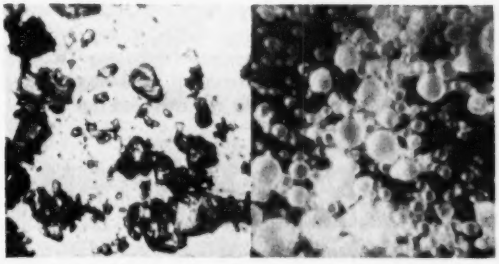
3 THE SILICA ALUMINA HYDROSOL is separated in the form of a hydrogel on a rotary string filter.



5 THE SPRAY DRYER is a 50-foot cone which operates at 700 F.

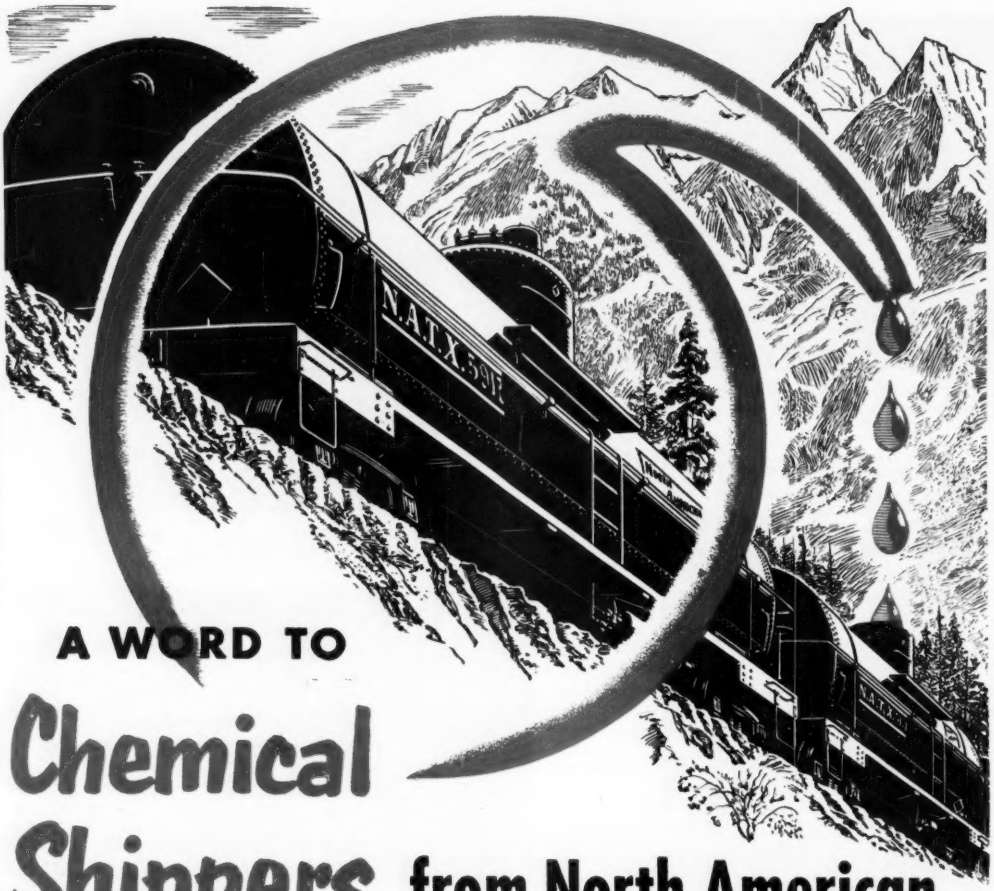


4 AFTER RESLURRYING, a high-pressure pump converts hydrogel into droplets at the top of the spray dryer.



8 MICROPHOTOGRAPHS contrast the jagged edges of the older-type ground catalyst (left) and the microspheroidal material.

9 MICROSPHEROIDAL CATALYST at work at a Cities Service refinery.



A WORD TO Chemical Shippers from North American

Today's zooming production has created demands for North American specialized tank cars that far exceed supply. To help meet these expanded requirements, North American is working hard to keep all tank cars rolling every minute possible . . . striving hard for maximum availability in order to better serve shippers from coast to coast. And, as always, North American stands ready to apply 43 years' transportation experience to any shipping problem of the chemical industry.

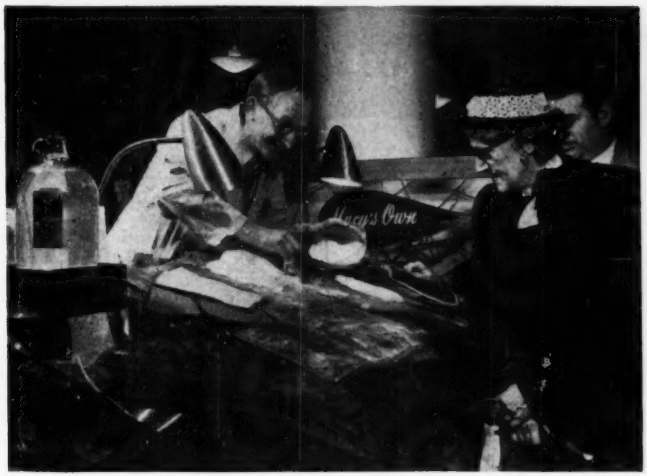
RIO GRANDE NATIONAL BLDG., DALLAS, TEXAS
739 PILLSBURY AVENUE, ST. PAUL 4, MINN.
SHELL BUILDING, ST. LOUIS 3, MO.
91 SOUTH MAIN STREET, FOND DU LAC, WIS.
681 MARKET STREET, SAN FRANCISCO 5, CALIF.
60 EAST 42ND STREET, NEW YORK 17, N. Y.

NORTH AMERICAN CAR CORPORATION

NORTH WESTERN REFRIGERATOR LINE COMPANY

231 South LaSalle Street, Chicago 4, Illinois

A nationwide organization with branch offices in important market centers



RUG SHAMPOOS: Aerosols will soon be moving into the picture.

Season for Foam

Ready-made foam makes debut as rug and upholstery cleaner. Aerosol-dispensed, it's the first canned suds in the household cleaning field.

During the current heavy selling season, however, conventional rug and upholstery shampoos will hold onto most of the market. These are liquids, pastes and powders containing good foam producers.

Extending "canned suds," already established as hair shampoos and shaving creams (*CI, Sept.* 1950, *p.* 378), to the rug and upholstery cleaners field is a logical development. For the rich lather produced by detergent solutions generally has been used in the actual cleaning operation.

Most products sold for this purpose are liquid concentrates, powders or pastes that are diluted or dissolved in water and worked up into a heavy foam. This cleans the fabric or rug without soaking it, in effect gives a "dry shampoo." Woolen fabrics don't shrink; upholstery doesn't get moldy; wooden frames don't swell; and in the case of rugs, neither the sizing or jute backing is damaged.

With the new aerosol product, preliminary mixing and lather preparation is reduced to pressing a button. The foam, ready to use, is pushed out of the can by a liquefied gas propellent.

Home Town Start: Quick Foam, as the new aerosol is called, is the product of Plasti-Kote, Inc., Cleveland. It has only recently been put on the market in that city, where a heavy promotional campaign is under way; but more general retail distribution is planned. A 12-oz. can sells for $1.49, is said to be sufficient for cleaning a 9x12 rug, a sofa and two chairs, or the complete interior of an automobile.

Plasti-Kote credits DuPont with developing the new cleaner, claims it is an entirely new synthetic detergent. DuPont's big interest is aerosols is as a market for its Freon propellents, and naturally its technical men are busy scouting new areas of application. The "new synthetic detergent" undoubtedly refers to the formulation devised to meet the troublesome corrosion problems encountered with foam aerosols.

At least one of the aerosol hair shampoos on the market contains a Duponol (fatty alcohol sulfate), and products based on sodium fatty alcohol sulfates have been among the most popular rug shampoos. A good guess is that the new product is a related formulation containing about 20% propellent. This amount of propellent is low for an aerosol, but aerated products require much less than insecticides, for example, which are about 85% propellent.

Different filling techniques are used too. With insecticides, both active ingredients and propellent are cooled and added to the container separately before filling. Chilled foam flows too slowly, however, so it is added at room temperature, the can is capped and the propellent pressured through the valve.

Just in Time: Quick Foam is finding its way into retail outlets just as the spring sales push for rug cleaners is getting into full swing. Salesmen are giving the usual arguments for cleaning rugs before summer storage, brightening up the living room furniture and getting the family buggy slicked up inside for the coming motoring season. This year they are also emphasizing the high cost of wool rugs and the necessity for stretching their life by proper cleaning. Economy-minded housewives are impressed by this argument as well as the you-can-do-it-at-home-cheaper appeal.

Most of the products that will be sold, however, will be of the standard types. Since the rug is not completely rinsed as it is in a commercial cleaning plant but is merely wiped free of foam and dirt with a damp rag or sponge, the problem of residues is important. Ingredients to be avoided are alkalies which promote wool hydrolysis; soap, often hydrolyzed by acidic wool to fatty acids, which cause resoiling; and liquid non-ionic synthetic detergents, which also promote resoil.

Among the best formulations are those based on fatty alcohol sulfates or alkyl aryl sulfonates alone or built with neutral salts. Soap solutions—generally composed of potash coconut oil, or potash or triethanolamine oleate soap—are also marketed however. Some products contain a little ammonia to brighten colors and to give a traditional household cleaner odor. Commonly the products are retailed as concentrates to be diluted before use, although pastes and powders are not unusual.

Familiar Story: The reason aerosols won't make more of a dent this year is simple: container shortages. Many specialties companies were

DRYMET*

ANHYDROUS SODIUM METASILICATE

A granular, free-flowing alkali with the following properties:

Formula . . . . . Na_2SiO_3
Molecular weight . 122.06
Melting point . . . 1088°C
Na_2O 51%
pH in a 1% solution 12.75

Quickly and completely soluble in water up to a concentration of 35%

DRYMET is the most highly concentrated form of metasilicate available because it contains no water of crystallization. Unique among alkalies—it combines strength with buffering action which prevents abrupt changes in pH. If you use alkali—investigate the advantages of DRYMET.

WRITE FOR DRYMET File Folder containing complete technical information.

*Reg. U. S. Pat. Off.

COWLES CHEMICAL COMPANY
71st Euclid Building
Cleveland 3, Ohio

RESINS
COUMARONE-INDENE
MODIFIED COUMARONE INDENE
ALKYLATED PHENOL
OXIDIZING
RESIN SOLUTIONS

COAL-TAR SOLVENTS
BENZOL
TOLUOL
XYLOL
HI-FLASH SOLVENT
COSOLS
52 N-1

PLASTICIZING OILS

CREOSOTE OILS

SHINGLE STAIN OILS

NEUTRAL OILS

TAR ACID OILS

NAPHTHALENE

PHENOTHIAZINE

TAR PAINTS

NEVILLE

NEBONY

A new, low cost, very mild odored, non-reactive, dark, neutral, thermoplastic resin derived from petroleum. Several melting points ranging up to 120°C, cube-in-mercury method. Soluble in aromatic and chlorinated solvents, ketones and esters and insoluble in water, alcohols, and glycols. Compatible with alkyd, phenolic, coumarone, styrene and natural resins; and with rosin, rubber and chlorinated rubber. Compatible in certain proportions with ethylcellulose, polyvinyl acetate and polyvinyl copolymers. Incompatible with cellulose acetate and nitrate, melamine and urea. Excellent reagent resistance. Uses: Mastic and rubber floor tile, rubber compounding, phonograph records, automobile undercoatings, fibreboard and paper impregnation.

CE-2D

THE NEVILLE COMPANY
PITTSBURGH 25, PA.

Plants at Neville Island, Pa., and Los Angeles, Calif.

hepped on foam aerosols last fall, but the military situation precluded counting on additional cans for a new product that is hardly in the necessary-to-defense category. That situation has held back rapid expansion of shaving creams and hair shampoos, has kept rug cleaners in the tentative category.

Plasti-Kote, however, is in a fairly good position. It is one of the largest manufacturers of aerosol spray enamels, and as such has a high allotment on cans. That isn't an abundance though, for Plasti-Kote doesn't think it can get as many cans for Quick Foam as it could sell.

But it will have enough to fulfill its present marketing program, which will establish its product name firmly in that field. When more cans are available, other companies will undoubtedly be making their bids with similar products.

Container Freeze

Specialties manufacturers will have to be happy with the design of the glass containers they are now using, and they may even have to adopt simplified designs in the future. But it is all for their eventual good.

That's the import of NPA's M-51 Order, probably the first NPA regulation not aimed merely at controlling an item, but at increasing production. It prohibits new design in glass containers, and establishes the means by which simplified styles of containers may be ordered if needed to get more production. Now NPA can order the packaging of specific products in simplified glass containers.

The agency says that not material shortages, but lack of glass-forming machinery and unrestricted designs are holding back production. Last year's output of glass containers was 106 million gross; estimate for 1951 is 120 million gross.

•

Soap Center: The Kansas City, Kan., area, location of both Colgate-Palmolive-Peet and Procter & Gamble plants for soap and synthetic detergents, continues to grow as a soap center. Construction has just got under way on Colgate's new $1 million six-story "heavy duty" detergent plant in the Armourdale district of Kansas City. When completed, the new facilities will give C-P-P double its present detergent capacity there.

The building is the second major detergent construction at Colgate's Kansas plant within the past four

years. The first was a $1 million detergent tower. Present construction, an extension of the earlier project, was held up pending completion of a multi-million dollar building nearby to house production of toilet articles. That building is now completed.

Some thirty-five miles away at Lawrence, Kan., Westvaco Chemical Division of Food Machinery & Chemical Corp. is now erecting a plant to make soluble phosphates used in the soap and other chemical process industries. This site, on the Union Pacific right of way, gives the company ready access to growing consumers in Kansas City.

•

More Cal. Insecticides: California Spray-Chemical is completing construction of an insecticide dust plant and branch office at Santa Maria, Cal. The plant, to have a maximum capacity of 80,000-90,000 lb per day, is designed to formulate such products as lindane, DDT, DDD, toxaphene, parathion and tetraethyl pyrophosphate.

•

Catalin Addition: Catalin Corp. of America is planning an addition to its Lexington, N.C., plant to begin manufacture of synthetic glue and textile resin.

•

Clorox Keeps Growing: North Kansas City, Mo. is the site for the newest plant of Clorox Chemical Co. Both a liquid bleach manufacturing unit and an office building will be built at a cost of about $400,000. Greater Kansas City will be the marketing area. Another unit is planned for Charlotte, N. C. (*CIW, Mar.* 17, 1951, *p.* 34) in the company's current expansion program.

•

Change of Mind: Coty, Inc.'s plans to build a one-story cosmetics plant at Newark, Del. have been changed. The company has withdrawn a petition for a zoning change to permit its proposed construction there, and has bought an 18-acre tract near Dover for the plant.

•

New N.C. Company: Carolina Co., Inc., Pinehurst, N. C., has just been granted a charter to operate a general soap and cosmetic business. Authorized capital stock is $100,000.

•

PICTURES IN THIS ISSUE

p. 18—Du Pont Co.; p. 19—Lyon Crawford; pp. 26-27—Longley; p. 27 (lower right)—Richie.

menadione, u.s.p. xiv
oil soluble vitamin k useful in hemorrhagic diseases, diatheses due to low thrombin content.

digitoxin, u.s.p. xiv
in cardiac therapy.

monobromated camphor
useful in certain chronic neurologic conditions.

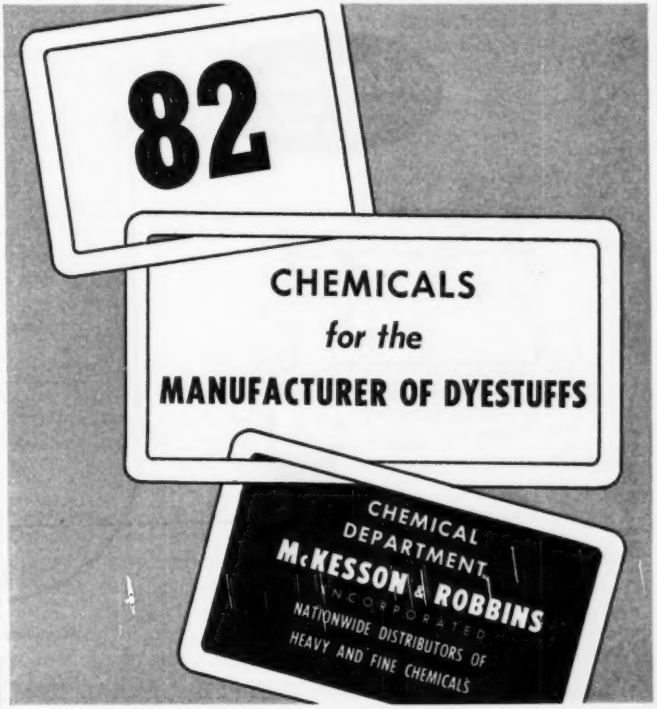
propyl gallate
an anti-oxidant for edible animal fats.

albumin tannate, medicinal
useful in control of intestinal disturbances.

dichloran
Lauryl dimethyl dichlorobenzyl ammonium chloride. Supplied in 10% and 50% concentrations as aqueous solution and 100% as a viscous water soluble material. The already high phenol coefficiency of quaternaries is increased in this product because of the chlorines on the aromatic component. We also manufacture other quaternary ammonium compounds.

write for our catalog

fine organics, inc.
211a EAST 19th STREET • NEW YORK 19, N. Y.

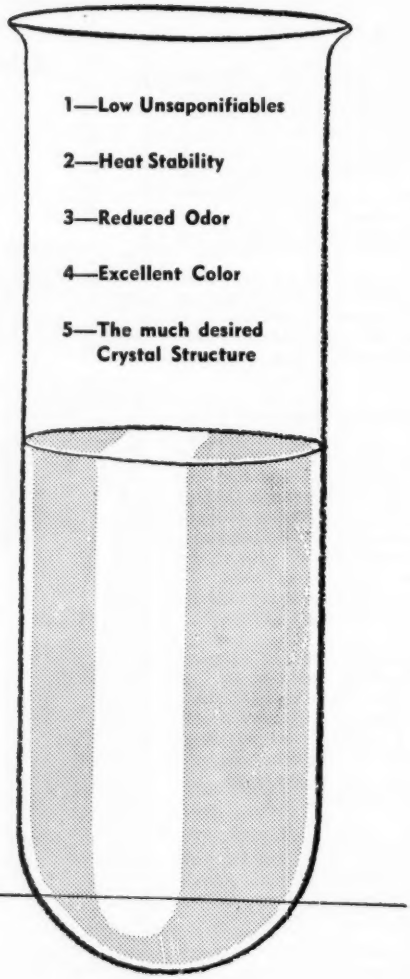


What Do You Look For in a Stearic Acid?

You can have them all in A. Gross Stearic Acids.

Through years of constant research and development, employing the most modern equipment, A. Gross has maintained the natural balance of palmitic and stearic acid found in tallow as indicated by the excellent crystal structure of our Stearic Acid.

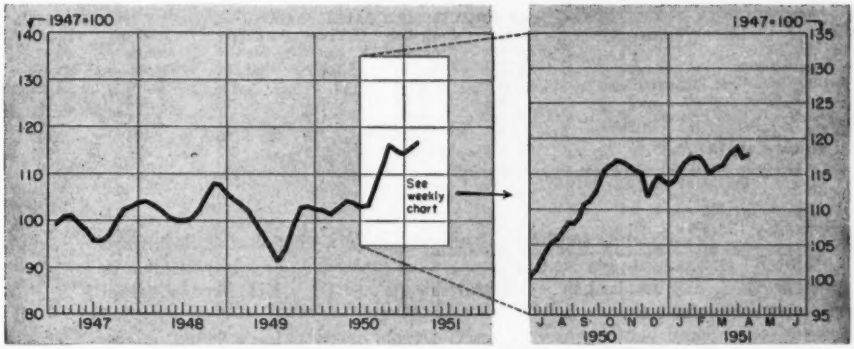
In looking for a choice Stearic Acid demanded by the discriminating manufacturer of cosmetics, food emulsifiers, pharmaceuticals, or any other products utilizing stearic acid, the answer is



A. GROSS & Company
295 MADISON AVE., NEW YORK 17, N.Y.
FACTORY: NEWARK, N.J.

Manufacturers Since 1837

CHEMICAL MARKETS....



CHEMICAL INDUSTRIES OUTPUT INDEX—Basis: Total Man-Hours Worked in Selected Chemical Industries

Price topics this week of particular interest to the chemical industry were:

Drug manufacturers and formulators urged continuance of GCPR in preference to the proposed OPS regulation based on pre-Korea prices plus manufacturing cost increases. Chief objection: Probable turmoil in established fair-traded drug prices.

The Office of Price Stabilization, trying to alleviate numerous price inequities, has exempted chemicals in the development stage from price controls.

Rarely has the chemical industry witnessed such international activity as marks the present search for more sulfur. Best new for unsated users in the accelerated exploration for more Frasch-mineable sulfur in the Gulf Coast area, and stepped-up activity in Italy and Mexico. In the meantime, the International Materials Conference debates the feasibility of international allocations.

Recent foreign expansion by several pharmaceutical companies is aimed at improving the industrial economy of some dollar-short countries, while boosting export markets of participating firms. Latest examples: Sharp & Dohme will build in the Phillipines, Wyeth is expanding its operations in Buenos Aires.

That familiar refrain of "better process, lower costs" is repeated in the case of the amino acid,l-tryptophane. An improved method of separating the natural product this week permitted Mann Fine Chemicals, Inc. to lower prices 50%, to the same level as the synthetic racemic product.

MARKET LETTER

WEEKLY BUSINESS INDICATORS	Latest Week	Preceding Week	Year Ago
Chemical Industries Output Index (1947=100)	118.3	118.0	104.5
Bituminous Coal Production (Daily Average, 1000 Tons)	1,752.0	1,698.0	1,954.0
Steel Ingot Production (Thousand Tons)	2,057.0	2,045.0	1,906.0
Wholesale Prices—Chemicals and Allied Products (1926=100)	144.8	145.3	117.5
Stock Price Index of 14 Chemical Companies (Standard & Poor's Corp.)	224.9	218.5	180.7
Chemical Process Industries Construction Awards (Eng. News-Record)	$9,852,000	$9,024,000	$7,541,000

MONTHLY BUSINESS INDICATORS—TRADE (Million Dollars)	MANUFACTURER'S SALES			MANUFACTURER'S INVENTORIES		
	Latest Month	Preceding Month	Year Ago	Latest Month	Preceding Month	Year Ago
All Manufacturers	$22,888	$23,377	$16,877	$35,561	$34,965	$28,990
Chemicals and Allied Products	1,656	1,703	1,130	2,414	2,370	2,022
Paper and Allied Products	684	709	495	797	778	701
Petroleum and Coal Products	1,826	1,791	1,479	2,105	2,134	2,123
Textiles	1,403	1,426	956	3,005	3,041	2,010
Leather and Products	378	338	273	612	652	501

Price trends in chemical imports have been pointing downward lately, excepting a few critical and scarce materials. Buyer resistance in the U. S. has resulted in significant declines in tin, quicksilver, menthol and carnauba wax.

Naphthalene and urea supplies from overseas have dwindled, due in part to heavier demand by European users. Urea prices have edged upward recently to a shade over 16¢ a pound, with unrelenting demand for plastics.

Indications of a revived chemical industry in Belgium are confirmed by comparison of postwar production with the 1939 base period. Biggest gain was registered in benzene-based products, more than double a decade before. A 50% increase in organic acids and nitrogen fertilizers are further evidence of progress.

Competition for the European market in the next few years is expected to become keener, especially with easing of restrictions on German chemical production.

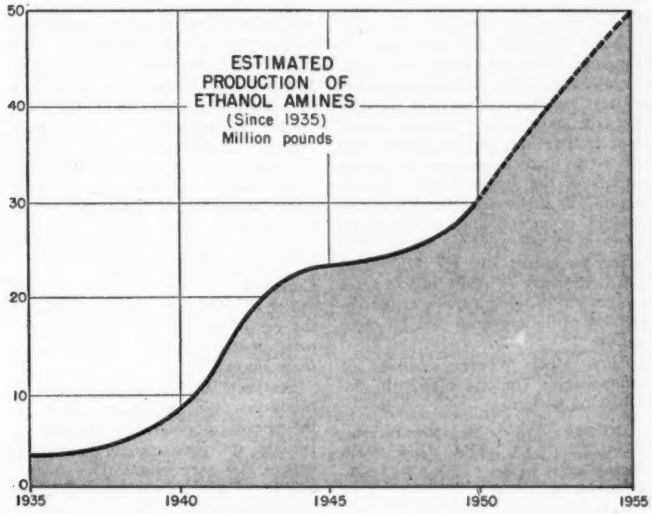
A synthetic rubber goal of 1 million tons is favored by the industry and the General Services Administration, but opinions differ on government stockpiling needs. Industry claims allocations have been too severe, cites many cases of plant shutdowns and partial unemployment; GSA defends stockpiling but implies a holiday may be near.

Users seeking less than carlots of pentaerythritol are paying in the 60-65¢ a pound range, a healthy increase over manufacturers' quotations of 35¢. A smaller margin currently prevails for para dichlorbenzene in l.c.l. quantities: resale is 22½¢ and manufacturers ask 17¢ a pound.

SELECTED CHEMICAL MARKET PRICE CHANGES—Week Ending April 16, 1951

	Change	New Price		Change	New Price
UP					
Beeswax	$ .02	$ .70	Pyrethrum, 0.9%, fine ground	$ .20	$ .75
Clove Oil, USP	.05	3.20	Rosin, gum, N.Y., X, cwt.	.70	10.45
Cocoa Butter	.015	.77			
DOWN					
Agar, powd., USP	.20	1.65	Oiticica Oil, tanks	.005	.325
Alcohol, tax-free, tankcars	.01	.89	Ouricury Wax, ref.	.03	.92
Anise, Chinese	.01	.36	Quicksilver, 76 lb. flask	1.00	214.00
Casein, dom.	.01	.42	Shellac, ref., bags	.01	.65
Coconut Oil, tanks, Pac.	.005	.19	Soybean Oil, crude, tanks	.005	.205
Menthol	.05	11.70	Tin	.035	1.47

All prices per lb. unless quantity is stated



ETHANOLAMINE OUTPUT: A steep slope ahead.

Ethanolamines Primed for Rise

Liquid detergents and sulfide gas recovery are in the forefront among expanding uses for ethanolamines.

New capacity will be ready by year's end as Jefferson joins Carbide and Carbon and Dow in turning out these chemicals.

Other glycol makers, who could channel part of their output into amines, are closely following the growing markets.

Consumer demand for liquid detergents and national policy to conserve sulfur, both in the news and apparently unrelated to each other, mean the same thing to present and future ethylene oxide producers. For the boom in detergents and recovery of sulfide gases both require more of the three ethanolamines: mono-, di-, and tri-.*

These important developments, however, represent only two phases of the fast-growing ethanolamine demand. Extremely diversified applications in textile and industrial detergents, emulsions, and specialized derivatives augur an even better future than the beneficent past.

Proceeding on this basis, expansion in ethanolamine facilities is en route to cut down the future waiting period of potential customers. Jefferson Chemical Co., subsidiary of American Cyanamid and Texaco, will bring its new plant into operation around the end of 1951 as an extension of its ethylene oxide production activities. It is an odds-on bet that other glycol producers are giving the industry-wide expansion more than casual attention.

Makers: Large-scale availability of the ethanolamines is relatively new, commercial development occurring only since 1928. Carbide and Carbon was the pioneer in making TEA—an extension of its early, kingpin position in ethylene oxide and ethylene glycol manufacture. MEA and DEA followed in the next few years. Dow Chemical moved into the picture about ten years later, and since World War II has doubled and redoubled its capacity.

At this writing, these are the only producers in the U.S., but the entry of Jefferson Chemical will add to the supply. Other prospective candidates for the select circle are Wyandotte, producing ethylene glycol since 1948, and Mathieson Chemical Corp., scheduled to make ethylene glycol in 1952 at its Brandenburg, Ky., site. Du Pont, major factor in making ethylene glycol by a different process, cannot conveniently extend its operations to make the ethanolamines.

Of the two major producers today, it may be pointed out that Dow has one competitive advantage in that its facilities are completely integrated, making both ethylene oxide and ammonia. However, Carbide is still the largest producer and makes a wider variety of derivatives.

Processes: Manufacture of ethanolamines is carried out commercially by reaction of ethylene oxide with ammonia, the proportions of MEA, DEA, and TEA depending on the ratio of reacting materials and reaction conditions.

Similarly, alkyl- and aryl-substituted ethanolamines are produced by reacting ethylene oxide with corresponding alkyl or aryl amines. Reactions in practically all cases are characterized by high yields; and flexibility is provided by selection of operating conditions to give the desired ratio of products.

Production Records: The small number of producers precludes disclosure of individual company production figures and plans, while accentuating the interest in what the other fellow is up to. This natural prudence, together with the extremely diversified end-use distribution, makes an accurate figure more difficult to arrive at in this stage of rapid growth.

CIW estimates that 30-35 million pounds is reasonably accurate for the existing annual capacity. Production should rise to not less than 50 million pounds annually by 1955, but it could hit a considerably higher level with the development of new uses or the expansion of the numerous existing ones.

Where They Go: Among the ethanolamines, TEA is well in the lead for popularity. In fact, few products have as many diversified uses as this ubiquitous chemical. A considerable boost in demand is in prospect with the rise of such liquid detergents (CIW, March 24, 1951) as Procter & Gamble's Joy.

A considerable outlet for TEA is also found in the manufacture of 2,4-D liquid salts for herbicide control. Soaps made from TEA and oleic or stearic acid are used extensively in textile processing and cleaning, and in agricultural spray emulsions. Superior emulsifying properties and blandness

* Otherwise known as MEA, DEA, and TEA.

OFFER

Carbon Tetrachloride

And Other Chemicals

••••

PRIME SUPPLIERS

Prompt Shipment

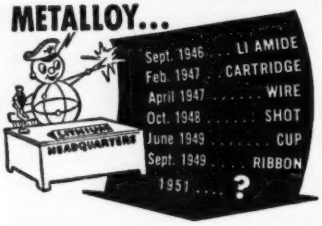
UNITED STERLING CORPORATION

37 E. 28th St., New York 16, N. Y.

Cable: UNISTERPLA

Phone: MU 9-2686

LITHIUM FORMS Pioneered by METALLOY...


LITHIUM
HEADQUARTERS
Sept. 1946 . . . LI AMIDE
Feb. 1947 . . CARTRIDGE
April 1947 . . . . . WIRE
Oct. 1948 . . . . . SHOT
June 1949 . . . . . CUP
Sept. 1949 . . . . RIBBON
1951 . . . . ?

To Aid Industry, Metalloy Has Pioneered the Manufacture of Lithium in These Forms:

Lithium Metal			
Cup	1 5 lb.	Shot	4-8 Mesh
Extruded Rod	½" & ⅝" Dia.		
Wire	⅛" Dia.	Ribbon	¼"
Cartridge (Encased in Copper Tubing)			2.25.
4.50, 9.0 & 108.0 Gram			

Lithium Hydride	Lithium Amide
Fine Ground	Crystalline

SPECIALISTS. Metalloy has developed special forms of Lithium and Lithium Compounds for many specialized applications. Check this list of ever expanding Lithium Salts, exclusive with Metalloy:

LITHIUM

Aluminate • Cobaltite • Manganite • Silicate Titanate • Zirconate • Sirconium • Silicate

AS A CONTRIBUTION TO ORGANIC RESEARCH, Metalloy's technical staff has prepared an "Annotated Bibliography on the use of Organolithium Compounds in Organic Synthesis." Annual Supplements will follow.

Let Metalloy and Lithium go to work for you today Write Dept. A for specific data on any of the above

IF IT'S LITHIUM — IT'S METALLOY

METALLOY CORPORATION

RAND TOWER MINNEAPOLIS, MINN.

Division LITHIUM CORPORATION OF AMERICA, INC.

of triethanolamine soaps are the basis for their use in cosmetics, shampoos, and creams.

MEA and DEA find wide applications in many industrial and commercial emulsions, including emulsion paints, "soluble" cutting and lubricating oils, and polishes. Equally important is their use in the manufacture of fatty acid amide surface-active agents of the Igepon type. DEA is specifically in demand for the manufacture of morpholine, premium ingredient of self-polishing waxes. Another prominent use for MEA and DEA—recovery of acidic sulfide gases—is certain to bring a quick expansion in view of the universal plea for more sulfur.

How Much Where: End-uses of ethanolamine conform closely to the following pattern:

Usage	In Million Pounds		
	TEA	DEA	MEA
Surface-active amides		1.5	1.5
Ethanolamine household detergents	5.0		
Gas scrubbing		1.5	2.0
Cosmetics	5.0		
Textile processing & cleaning	3.5		1.0
Agricultural:			
2,4-D salts	1.0		
Agricultural sprays	1.5	1.0	2.0
Emulsion cleaners and polishes	1.5	0.5	2.0
Other alkylolamines	0.5	1.5	0.5
Total	18.0	6.0	9.0

What Users Pay: Anyone who bought ethanolamines twenty years ago, when they were first introduced, had to pay around $3.50 a pound. Since then, development of larger-volume uses, lower costs of ethylene and ammonia, and improved technology caused prices to drop to a low of 17¢ shortly after World War II. Rising raw materials costs have since forced manufacturers to boost prices to the current values per pound in tank cars, delivered:

TEA—24½¢, DEA—27½¢, and MEA—28¢

Currently, the ethanolamines are in rather short supply, and activities in the resale market have brought the price in less carlots to nearly double these quotations.

Prospects Ahead: As the interest of producers and consumers attest to the growing popularity of the ethanolamines, the prospects for future advances look very bright. The diversification of uses should insure a stabilized growth, and the expansion of particular uses in liquid detergents and sulfur-gas recovery will lead to an early strain on existing facilities. The new plant of Jefferson Chemical will prevent the shortage from getting acute during the next year, and other glycol manufacturers will undoubtedly try to be helpful in the future.

The best growth prospect for the next few years is TEA, since it is the most diversified.

GOVERNMENT NEEDS

Raritan Arsenal, Metuchen, N.J.

Bid Closing Date	Bid Invitation No.	Quantity	Item
Apr. 26	51-445	156,000 lbs.	hydrochloric acid
Apr. 27	51-446	16,056 lbs.	hydrochloric acid
Apr. 27	51-447	750,000 lbs.	sulfuric acid

Navy Purchasing Office, 111 E. 16 St., N.Y.

Apr. 25	8640	2,016 gals.	sodium silicate solution
Apr. 25	8643	150,000 lbs.	soap powder
Apr. 26	8632	3,600 gals.	watch-rinsing solution
Apr. 26	8654	58,800 lbs.	grit soap
Apr. 27	8677	13,000 lbs.	powdered laundry soap
Apr. 30	8623	12,000 gals.	DDT insecticide
Apr. 30	8654	2,200 lbs.	red squill, fortified
Apr. 30	8638	95,000 lbs.	sodium metaphosphate
Apr. 30	8706	50,000 lbs.	powdered hand soap
Apr. 30	8724	50,000 lbs.	absorbing compound
May 1	8713	204 qts.	chloride indicator
May 1	8713 (same)	4,008 qts.	mercuric nitrate solution
May 1	8722	1,500 lbs.	potassium hydroxide
May 2	8645	198,000 lbs.	caustic soda (lye)
May 2	8707	25,000 lbs.	cupric (copper) sulfate
May 3	8693	500,000 lbs.	powder laundry soap
May 4	8708	2,000 lbs.	ferric ammonium oxalate

General Services Administration, 1114 Commerce St., Dallas, Tex.

Apr. 25	FW-12873	7,548 lbs.	paste floor wax
Apr. 25	FW-12873	15,840 gals.	water emulsion floor wax

General Services Administration, 250 Hudson St., New York 13, N.Y.

Apr. 23	2K-28832	125 cases	toilet soap
Apr. 23	2K-28832	4,000 lbs.	low titer soap

General Services Administration, Region 3, Washington 25, D.C.

Apr. 23	5M-98764-R	500 qts.	pigment in oil-raw umber
Apr. 23	5M-98764-R	700 half-pts.	pigment in oil-raw sienna
Apr. 23	5M-98604-R	4,500 gals.	interior oil paint, flat
Apr. 23	5M-98604-R	1,750 gals.	paint, primer-sealer, white
Apr. 23	5G-99011-R	7,908 qts.	pigment in oil various
Apr. 23	5G-99011-R	10,896 half-pts.	pigment in oil various
Apr. 26	5M-98601-R	2,000 lbs.	glue (flake, animal)
Apr. 26	5M-98601-R	12,000 pts.	glue (liquid)

BOOKS . . . . . .

Report Preparation, by Frank Kerekes and Robley Winfrey. The Iowa State College Press, Ames, Iowa. xiv+449 pp., $6.90.

Guided by the belief that all persons training or active in careers in business, science, industry or the professions should have the ability to write lucid and effective reports, the authors set forth the underlying principles and techniques involved in report preparation.

In this volume emphasis is placed upon the complete process of report preparation rather than upon the single skill of writing. Since this type of communication calls for the specialized application of surveys, research, English composition and organization, and mechanical arrangement, the writers accordingly present certain specific techniques to be followed in the collection of data, in the assimilation and analysis of pertinent information, and in the expression of ideas by graphic, tabular and mathematical systems. The book covers in detail the mechanical aspects—style, format and methods of material presentation—as well as the various steps followed in expressing ideas. Final sections cover the topics of magazine feature articles and technical papers, etc.

Soybeans and Soybean Products, Volumes I and II, edited by Klare S. Markley. Interscience Publishers, Inc., New York, N. Y.; xxxiii+1145 pp., $11 per volume.

Within the last 25 years the soybean has grown from relative insignificance to first place among the oilseed crops of the Western Hemisphere. The soybean has created new industries, expanded many long-established ones; its derived products are consumed in a wide range of foods, feeds, and industrial products and processes. In order to cover the phenomenal scope of the science and technology of the soybean, this monograph has been prepared in two volumes by a group of experts who possess detailed knowledge and personal experience in specialized fields.

Major sections treating the various aspects of the soybean include soybean production, structure and composition, processing, and utilization of soybean products; each section is broken down into detailed chapters, each written by an authority on the subject. Technological processes are discussed primarily from the viewpoint of industrial practice in the United States.

Chemical Who's Who, Third Edition, edited by Williams Haynes. Lewis Historical Publishing Co., Inc., New York, N. Y.; xv+895 pp., $15.

A biographical dictionary of leaders in all phases of the chemical sphere, this third edition follows the previous one after a lapse of 14 years; it is now broadened in scope and expanded to contain fifty per cent more biographies. In order to keep the book up-to-date and therefore, at its maximum value and usefulness, it is intended to publish subsequent editions at regular intervals of three or four years. Marking an innovation from past editions, this book includes chemical authorities in the field of chemical education and research as well as the executives of chemical companies, plant superintendents, purchasing agents, librarians, chemical brokers and dealers, and importers and exporters. All the biographical information contained is supplied first-hand by the selected leaders.

EXPERIMENTAL PHYSICS RESEARCH
Photochemistry, Chemical Kinetics, Reaction Rate Studies, Vapor Pressure of Low Pressure Substances, Structure of Solids and Adsorption Studies.
THE ANDERSON PHYSICAL LABORATORY
CHAMPAIGN, ILLINOIS

PROFESSIONAL SERVICES
Consulting • Designing • Marketing • Testing • Analysing
Developing • Evaluating • Inspecting • Research

EVANS
RESEARCH AND DEVELOPMENT CORP.
Chemical Research ▶ Processes ▶ Products
Development Problems
Complete Laboratory ▶ Pilot Plant ▶ Mechanical and Optical Sections
Ask for NEW Scope Sheet C listing over 100 of our activities.
250 East 43rd Street, New York 17, N. Y.

LEBERCO LABORATORIES
Hormone Assays • Drug Assays
Pharmaceutical and Cosmetic Research
Sterility Tests • Toxicity Studies
Send for information concerning our services
125 HAWTHORNE ST., ROSELLE PARK, N. J.

CLARK MICROANALYTICAL LABORATORY
CH, N, S, Hal., Alkoxyl, Alkimide, Acetyl, Terminal Methyl, etc. Complete and competent service by specialists in organic micro-chemical analysis.
Howard S. Clark, Director
104½ W. Main St. Urbana, Ill.

D. H. KILLEFFER
168 WESTCHESTER AVENUE
TUCKAHOE 7, N. Y.
Phone: SPENCER 9-6821
PUBLIC RELATIONS FOR CHEMICAL ENTERPRISES

ROGER WILLIAMS, INC.
• ENGINEERING ECONOMICS
• MARKET RESEARCH
• TECHNICAL WRITING
• TECHNICAL BOOKLETS
Write for "Profit Evolution"
148 East 38th Street, New York City 16
Murray Hill 5-8508

CONSULTING
Rubber Technologist
Natural and Synthetic Rubber
R. R. OLIN LABORATORIES
Complete Rubber Testing Facilities
Established 1927
P. O. Box 372, Akron 9, Ohio
Telephone HE 3724, FR 8351

R. S. ARIES
AND ASSOCIATES
Chemical Engineers & Economists
Process Analysis • Surveys — Technical & Economic • Market Research • Product Development • Evaluations • Application Research
400 Madison Ave. N. Y. 17, N. Y. ELdorado 5-1480

COLBURN LABORATORIES, INC.
Research Chemists
• New Product Development
• Organic Synthesis and Research
• Non-routine Analytical Work
723 S. Federal St. Chicago 5, Ill.

Sponsored Industrial Research
Bjorksten Research Laboratories
323 W. Gorham St., Madison 3, Wis.
13791 S. Avenue "O", Chicago 33, Ill.
50 East 41st St., New York 17, N. Y.

SEARCHLIGHT SECTION

(Classified Advertising)

EMPLOYMENT: "OPPORTUNITIES" :EQUIPMENT
BUSINESS: :USED OR RESALE

UNDISPLAYED —RATES— DISPLAYED

$1.50 a line. Minimum 4 lines. To figure advance payment count 5 average words as a line.
Employment Wanted & Individual Selling Opportunity undisplayed advertising rate is one-half of above rate, payable in advance.
Box Numbers—Care of publication count as 1 line.
Discount of 10% if full payment is made in advance for 4 consecutive insertions.
Equipment Wanted or For Sale Advertisements Acceptable only in Displayed Style.

Individual Spaces with border rules for prominent display of advertisements.
The advertising rate is $8.50 per inch for all advertising appearing on other than a contract basis. Contract rates quoted on request.
An advertising inch is measured ⅞" vertically on one column, 3 columns—30 inches—to a page.
New Advertisements received by April 25th at the New York office, 330 W. 42nd St., N. Y. 18, will appear in the May 5th issue subject to space limitations.

Johnson Wax Company.—

We have several permanent openings for chemists in our new laboratory at Racine, Wisconsin. Excellent working conditions and benefit programs. We will consider applicants under 36 years of age with any of the following backgrounds.

M. S. in Physical Chemistry with experience or training in colloids. Development work.

M. S. in Organic Chemistry or equivalent. Research work on fatty or waxy materials.

B. S. in Organic or Physical Chemistry. Experience not required. Openings in both Research and Development.

Chemical Engineer. Experience not required. For process development on a pilot plant scale or technical service work.

Address inquiries to Dr. R. N. DuPuis, Research and Development Div., S. C. Johnson & Son, Inc., Racine, Wisconsin, giving full details as to age, education, experience, draft status, and salary requirements. Replies will be kept confidential and handled promptly.

YOUR DEFENSE AGAINST MACHINERY SHORTAGES

Call **"CONSOLIDATED"**

USED MACHINERY FOR THE CHEMICAL & PROCESS INDUSTRIES

Including Paint, Food, Rubber, Plastics, Sugar, Drugs, Cosmetics and Allied fields. Single items to complete plants.

CASH FOR YOUR IDLE EQUIPMENT

CONSOLIDATED
PRODUCTS COMPANY, INC. BArclay 7-0600
14-18 Park Row New York 38, N.Y.

1—Fitz. Comminuting Machine, Model D, stainless steel.
2—Mikro Pulverizers, #2-SI, Bantam (stainless)
8—Rotary Pellet Presses: Stokes D-3, Stokes D-4, Kux Model 25.
1—100 gal. Stainless Steel Type 347 Tank, 18" x 9', 250# pressure.
10—Stainless Steel Tanks, Type 316, 50 gal. and 80 gal., 30# pressure.

PERRY EQUIPMENT CORP.
1521 W. Thompson St.
Phila. 21, Penna.

MARKET PLACE

LOCAL STOCKS • CHEMICALS
• RAW MATERIALS
EQUIPMENT • SUPPLIES

FREE Catalog No. 677

Lists more than 300 items for Research: BIOLOGICAL — MICROBIOLOGICAL — BIOCHEMICAL — BACTERIOLOGICAL — NUTRITIONAL

Save Time Use this catalog as a ready reference for biochemicals, media, and test diets. Write for it.

GBI 69 LABORATORY PARK CHAGRIN FALLS, OHIO

PEN MICROSCOPE

CARRY IN VEST POCKET

QUICK ADJUSTMENT FOR 40, 50 OR 60 POWER. QUICK, PERFECT FOCUS. NO LONGER THAN FOUNTAIN PEN. BEAUTIFUL SATIN NICKEL FINISH. PERFECT FOR "ON-THE-SPOT" INSPECTION IN PLANT, OFFICE, LABORATORY OR HOME.
PRICE $15.75. FREE LEATHER CASE.

100% SATISFACTION GUARANTEED OR MONEY BACK

ABBEON SUPPLY CO.
41st DRIVE • WOODSIDE, N.Y.

Butadiene Sulfone
Mucobromic Acid
Nitromalonic Ester
Triphenylchloromethane

ORGANIC SYNTHESES COMPANY
3182 Brooklyn, Detroit 1, Mich.

GEAR UP FOR BIGGER PRODUCTION WITHOUT DELAY

GOOD USED EQUIPMENT

Ready for Immediate Shipment

It's Impossible to List in this space the 5000 Machines available from your FIRST SOURCE

Send for our Latest List

FIRST MACHINERY CORP.
107 HUDSON ST. WORTH 4-5900 NEW YORK 13, N. Y.

SPECIAL OFFERINGS

2 Hormann Pressure Leaf Filters, 316 s.s., having 20-24" dia. leaves, like new
Day 15 gal. Jktd. Mixer, 2 cored Masticator Arms, with gear reducer & 5 HP motor
Day S.S. 5 Gal. Sigma, Double Arm Vacuum Mixer

Many Other Items Available
What Have You For Sale?
You Can BANK On The

EQUIPMENT CLEARING HOUSE, INC.
289-10th ST., BKLYN 15, N.Y.

GEARED TO SERVE YOU
NEW 1000 lb. dry powder mixer
Fitzpatrick Model D S.S. mill.
Pfaudler 30 gal. G.L. reactor.
What Have You For Sale?

JASPER MACHINERY CO. INC.
1123 BROADWAY 10, NEW YORK
CHelsea 3-9010 9011

Searchlight Section

POSITION WANTED

PROFESSIONAL ENGINEER: Chemist-Engineer (39), opening office and laboratory in Pittsburgh for practice of chemistry and engineering, looking for consulting position. Presently in charge of technical operations of integrated oil refinery producing complete line of petroleum products ranging from jet fuel to U. S. P. petrolatums, lubes and rust preventives. Eighteen years record of accomplishment in research, pilot plant and full scale operations with leading companies in petroleum, electrical and general manufacturing. Complete details on request. Patents and inventions. Educated Cornell University and University of Pittsburgh. Let me work with you in process development, research, trouble shooting and rush jobs. Emerson Venable, 6111 Fifth Ave., Pittsburgh 32, Pa. Phone: Pittsburgh HI-land 1-8045.

WANTED
CAUSTIC SODA SOLID
76%, up to 100 tons, packed in metal drums, April July delivery.
SIMMONS PRODUCTS CO.
15 Moore St., New York, N. Y.
WHitehall 4-8700

READER SERVICE . . . .

HOW TO USE COUPON

Mail the coupon at the bottom of page. Circle page numbers of items about which you want more details. Then write your name and address and mail it to us. Your request will be forwarded to companies concerned, the answer coming direct to you.

MAKES IT HANDY

Products and literature in this issue are listed on these pages. There are three indexes. (1) Editorial items on new products, new equipment, new literature; (2) products advertised. (3) The index of advertisers is on the following page.

THE NUMBERS

Advertisements:—There is a page number on the coupon for each advertisement. Before the number, may appear, L, R. T. B (left, right, top, bottom), locating the ad on the page; small letters following (a,b,c) indicate additional products in the advertisement.

Editorial Items:—Numerals are page numbers; the ABC's distinguish among items where more than one is on a page. There is a number on the coupon for each item referring to new products, equipment, and literature.

EDITORIAL ITEMS

For more data, circle number on coupon.

NEW PRODUCTS

3,3'-Diamino-4,4'-dihydroxydiphenylsulfone 22A
4,4'-Dichloro-3,3'-dinitrodiphenylsulfone 22B

NEW EQUIPMENT

Corrosion Comparator 25A

TECHNICAL LITERATURE

CHEMICALS

Organic Chemicals 40A
Plastics Molding Powders 40C
Resin Stabilizer 40D
Vinyl Acetate Resins 40B

EQUIPMENT

Equipment
Calender Drives 40I
Control Device 40O
Conveyor Chain 40L
Counter Tubes 40H
Fibrous Sheet Materials 40E
Hydro-Treator 40F
Liquid and Gas Pump 40G
Plastic Pipe 40J
Potentiometer Controllers 40N
Strain Gages 40K
Water Cooling Unit 40M

PRODUCTS ADVERTISED

For more data, circle number on coupon

Chemicals
Albumin tannate, medicinal T31e
Alkyl benzoates
Ethyl benzoate 11b
Isopropyl benzoate 11a
Methyl benzoate 11d
N-butyl benzoate 11c
Ammonium bichromate 8e
Anhydrous sodium metasilicate T30
Benzaldehyde 42a
Benzoic acid 42h
Benzol 20
Benzyl chloride 42g
Berez 22e
Bicarbonate of soda T3a
Buffing compounds, ethomid HT 160 ..... 7f
Butyl cellosolve, stearates B3a
Carbon tetrachloride T36
Chromic acid 8f
Coal-tar 4
Copper carbonate 2d
Copper sulphate 2a
Cyanuric chloride 41
Dichloran T31f
Diethyl maleate 12
Digitoxin T31b
Dimethylalkylamines 7c
Ester gums 22c
Ethyl benzoate 42f
Fatty acids
Neo fat D142 for oil replacement 7b
Neo fat S142 for oil replacement 7a
Ferric iron sulphate 2e
For dyestuffs B31
Formaldehyde 42i
Industrial 17
Industrial oils 7d
Insecticide concentrates B25
Laurate oleate B3b
Lithium compounds B36
Maleic modified esters 22g
Manganese sulphate 2c
Menadione T31a
Methyl benzoate 42e
Methyl salicylate 42b
Monobromated camphor T31c
Monohydrate of soda T3b
Oils, gloss 22f
Potassium bichromate 8c
Potassium chromate 8d
Propyl gallate T31d, 42d
Propyl parasept 42c
Resins, nebony B30
Rosins
Limed 22b
Pale wood 22d
Sal soda T3c
Shippers 28
Sodium bichromate 8a
Sodium chromate 8b
Stearic acid 32
Trichloroethanol data sheet S-23 I
Turpentine, wood 22a
Vitamin A acetate, crystalline 23a
Vitamin A palmitate, crystalline 23b
Waxes, microcrystalline 1
Zinc hydrosulphite T25
Zinc sulphate 2b
Color conversion chart 7e
Sulphur 24

SEARCHLIGHT SECTION

(Classified Advertising)

Professional Services 37
EMPLOYMENT
Positions Vacant 38
Position Wanted 38
EQUIPMENT
(Used or Surplus New)
For Sale 38
WANTED
Miscellaneous 38

ADVERTISERS INDEX

Consolidated Products Co., Inc. 38
Equipment Clearing House, Inc. 38
First Machinery Corp. 38
Jasper Machinery Co. 38
Johnson & Son, S. C. 38
Perry Equipment Corp. 38
Simmons Products Co. 38

READER SERVICE COUPON

Mail to Chemical Industries Week, 330 W. 42nd St., N. Y. 18, N. Y.

NAME _____

POSITION _____

COMPANY _____

ADDRESS _____

CITY & STATE _____

Editorial Items

22A	40A	40D	40G	40J	40M
22B	40B	40E	40H	40K	40N
25A	40C	40F	40I	40L	40O

Advertisements

I	2e	4	7f	8f	17	22e	T25	T31b	32	42e
1	T3a	7a	8a	11a	20	22f	B25	T31c	T36	42d
2a	T3b	7b	8b	11b	22a	22g	28	T31d	B36	42e
2b	T3c	7c	8c	11c	22b	23a	T30	T31e	41	42f
2c	B3a	7d	8d	11d	22c	23b	B30	T31f	42a	42g
2d	B3b	7e	8e	12	22d	24	T31a	B31	42b	42h
										42i

Expires July 21, 1951

BOOKLETS . . . . . .

Chemicals

Organic Chemicals

28-p. technical data folder furnishing detailed information on various plasticizers and glycol and glyceryl esters used as plasticizers for synthetic resins and finding widespread application in the textile, concrete, grinding aids and lubricating oils industries; both specific and comparative data appear in reference to physical and chemical properties, solubility details, etc. Kessler Chemical Co., Inc.

Vinyl Acetate Resins

28-p. technical booklet providing data on forms, properties and applications for the vinyl acetate and vinyl alcohol-acetate resins by means of graphs and tables as well as text; detailed information is given for the preparation of these resins for adhesives and other commercial uses, such as in paper coatings, and metallic inks and lacquers. Bakelite Co., Union Carbide and Carbon Corp.

Plastics Molding Powders

34-p. pocket-sized reference booklet describing a wide variety of grades as well as powder and molded properties, all grades listed conforming to United States military specifications. General Electric Co.

Resin Stabilizer

Data sheet discussing "Staflex QMXA," a barium salt of a complex organic acid, whose primary function is the absorption of hydrogen chloride at all temperatures without the introduction of undesirable side reactions. Deecy Products Co.

Equipment

Fibrous Sheet Materials

Looseleaf folder devoted to "Duroids," a group of fibrous sheet materials, compiled especially for designers and materials engineers seeking non-metallic sheet materials for special requirements, with each sheet treating one "Duroid"—its physical, electrical or chemical characteristics, test values, color, gauges and special application notes. Rogers Corp.

Hydro-Treator

32-p. illustrated bulletin discussing the hydro-treator, a high-rate unit designed for softening, color or turbidity removal from municipal or industrial water supplies and operating on the up-flow or sludge blanket principle; contains data on operating results, capacity ratings, and chemical dosing requirements. The Dorr Co.

Liquid and Gas Pump

4-p. bulletin devoted to pump for forcing liquids, solutions or gases through tubing in both laboratory and pilot plant work; included are operational details, construction and typical applications of the pump. E and M Enterprises, Inc.

Counter Tubes

6-p. brochure describing new-type counter tubes, with a thin mica window which has been rigidly sealed by using a strong low-temperature polymerizing fusion seal; also covered are the firm's optical scintillation kit, nucleometer, alpha-beta-gamma survey meter, etc. Radiation Counter Laboratories, Inc.

Calender Drives

8-p. bulletin furnishing information on construction features, operating principles, and installation of electronically-regulated drives for calendering rubber, plastics and similar materials; dimensions and horsepower ratings are given for all calender drive motors and motor-generator sets. General Electric Co.

Plastic Pipe

8-p. pamphlet featuring plastic pipe, furnished in two grades—(1) for lines carrying liquids or gases that are not for human consumption and (2) for lines carrying liquids for human consumption; finds multiple applications in every field including electrical uses of all kinds. Johnson Plastic Corp.

Strain Gages

2-p. bulletin showing graphic performance and giving specifications for 10 new type strain gages, developed to provide a means of cancelling out the unwanted temperature effects and allowing measurement of only those strains due to stresses. Baldwin-Lima-Hamilton Corp.

Conveyor Chain

4-p. bulletin drawing attention to new type conveyor chain that makes possible elimination of the necessity of transferring containers from one conveyor to another, flexes in both horizontal and vertical planes and curves around corners. Chain Belt Co.

Water Cooling Unit

4-p. folder giving information on a portable, self-contained water cooling unit designed for industrial work wherever a continuous supply of automatically controlled re-circulated chilled water at certain temperatures is required. Mayer Refrigerating Engineers, Inc.

Potentiometer Controllers

4-p. bulletin giving information on multi-record strip chart electric control potentiometers, furnished in both contact and proportional control types, and equipped with either a single or double set-point index. Minneapolis-Honeywell Regulator Co.

Control Device

Bulletin describing supplementary control device which anticipates the fuel needs of controlled heating equipment, thereby enforcing a straight "hairline" control on the process variable. Wheelco Instruments Co.

ADVERTISER'S INDEX

American Cyanamid Company . . 3rd cov.
Armour & Co. 7

Bareco Oil Co. 1
Barrett Division of
Allied Chem. & Dye Corp. 4

Carbide and Carbon Chem. Co.
Div. of Union Carbide & Carbon . 11
Church & Dwight Co., Inc. T3
Commercial Solvents Corp. 12
Cowles Chemical Co. T30
Crosby Chemicals, Inc. 22

Fairmount Chemical Co., Inc. T20
Fine Organics, Inc. T31

Gross & Co., A. 32

Heyden Chemical Corp. . . . . back cov.

Kessler Chemical Co., Inc. B3

McKesson & Robbins, Inc. B31
McLaughlin, Gormley, King Co. . . . B25
Metalloy Corp. B36
Mutual Chemical Co. of American 8

Neville Co., The B30
North American Car Co. 28

Pfizer & Co., Inc., Charles 23

Stauffer Chemical Co. 17

Tennessee Corp. 2
Texas Gulf Sulphur Co., Inc. 24

Union Carbide & Carbon Corp.
Carbide & Carbon Chemicals Div. . . 11
United States Steel Company 20
United Sterling Corp. T36

Virginia Smelting Co. T25

Westvaco Chemical Division,
Food Machinery & Chemical
Corp. . . . . 2nd cov.

BUSINESS STAFF

SALES MANAGER . . . . . By Sawyer

BUSINESS MANAGER . . . . Albert E. Weis

Atlanta . . . . . Ralph C. Maultsby, 1311 Rhodes-Haverty Bldg., Atlanta 3, Ga.

Chicago . . . . . Alfred D. Becker, Jr., Frank C. Mahnke, Jr., 520 N. Michigan Ave., Chicago 11, Ill.

Cleveland . . . . . Vaughan K. Dissette, 1510 Hanna Bldg., Cleveland 15, Ohio

Dallas . . . . . Jos. H. Allen, First Natl. Bank Bldg., Dallas 1, Texas

Los Angeles . . . . . Carl W. Dysinger, H. L. Keeler, 1111 Wilshire Blvd., Los Angeles 17, Cal.

New York . . . . . Knox Armstrong, Robert S. Muller, Charles L. Todaro, 330 West 42 St., New York 18, N. Y.

Philadelphia . . . . . William B. Hannum, Jr., Architects Bldg., 17th & Sansom Sts., Philadelphia 3, Pa.

San Francisco . . . . . Ralph E. Dorland, John W. Otterson, 68 Post St., San Francisco 4, Calif.

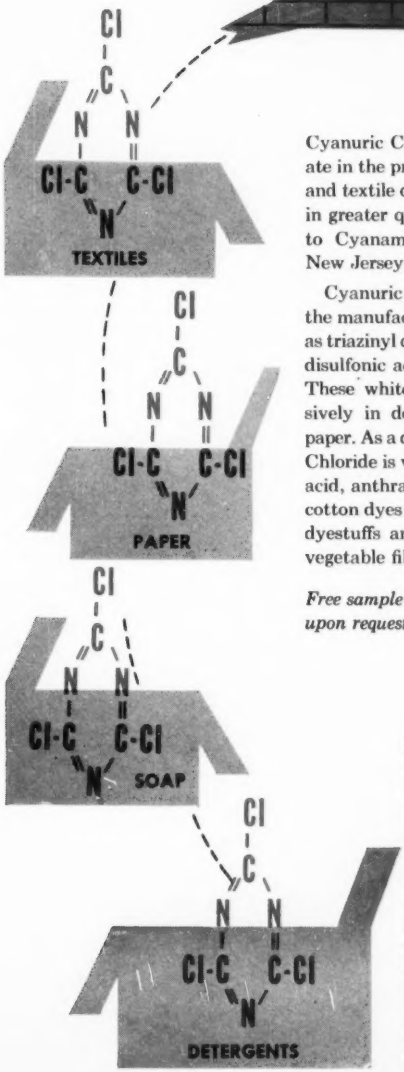
Boston . . . . 1427 Statler Bldg., Boston 16

Detroit . . . . 856 Penobscot Bldg., Detroit 26

Pittsburgh . . . 738 Oliver Bldg., Pittsburgh 22

St. Louis . . . . 3615 Olive St., Continental Bldg., St. Louis 8.

NOW, from a new Cyanamid plant <u>more</u> CYANURIC CHLORIDE for you!



Cyanuric Chloride, a valuable intermediate in the preparation of whitening agents and textile dyestuffs, will now be available in greater quantities for your use, thanks to Cyanamid's new plant at Warners, New Jersey.

Cyanuric Chloride is an intermediate in the manufacture of whitening agents such as triazinyl derivatives of diaminostilbenedisulfonic acid and diaminodiphenylurea. These whitening agents are used extensively in detergents, textiles, soap, and paper. As a dyestuff intermediate Cyanuric Chloride is valuable for the preparation of acid, anthraquinone, mordant, and direct cotton dyes where it links together known dyestuffs and increases their affinity for vegetable fibers.

Free sample or technical literature available upon request. Write today.

CIW-1

AMERICAN *Cyanamid* COMPANY

Synthetic Organic Chemicals Dept.
30 ROCKEFELLER PLAZA, NEW YORK 20, N. Y.

Gentlemen:

☐ Please send me literature on Cyanuric Chloride
☐ Please send me a sample of Cyanuric Chloride

Name..... Position.....

Company.....

Address.....

City..... State.....

In Canada: North American Cyanamid Limited, Toronto and Montreal

Serving Industry through Finer Chemicals!

Heyden has long been known as a primary manufacturer and bulk supplier of high quality intermediates and aromatic chemicals. Many of these are used in the production of perfume compounds, sanitary chemicals, soaps and deodorizers. Others serve as preservatives and anti-oxidants essential to stabilization of fine cosmetics, toiletries and related products.

Write for samples and further information.

FINE HEYDEN CHEMICALS

HEYDEN CHEMICAL CORPORATION • 393 Seventh Ave., New York 1, N.Y.

CHICAGO • PHILADELPHIA • SAN FRANCISCO • DETROIT • PROVIDENCE

Benzyldehyde • Benzoates • Benzyl Chloride • Bromides
Chlorinated Aromatics • Creosotes • Formaldehyde
Formic Acid • Glycerophosphates • Guaiacols
Hexamethylenetetramine • Medicinal Colloids • Methylene
Disalicylic Acid • Paraformaldehyde • Parahydroxybenzoates • Penicillin • Pentaerythritols • Propyl Gallate
Resorcinol • Salicylates • Salicylic Acid • Streptomycin

HEYDEN *Chemicals*